

West Lake Hunter Trail Feasibility Study

Existing Conditions Report



November 2020



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Project Context

FDOT District One, in partnership with the City of Lakeland and other stakeholders, is evaluating the feasibility of constructing a multi-use trail (shared-use path) between Ariana Street and Lime Street on Sikes Boulevard (SR-563) to determine a preferred design concept for the proposed West Lake Hunter Trail (Proposed Trail). This project will provide the contextual information supportive of a subsequent Project Development and Environment (PD&E) Study.

The Proposed Trail is approximately 1.4 miles long, located on the eastern side of Sikes Boulevard, wrapping around the western shore of Lake Hunter near downtown Lakeland. The Project Study Area is a ¼ mile radial buffer surrounding the proposed Trail. Map 1 shows the Study Area and Proposed Trail.

Existing land uses within the Study Area are primarily residential and institutional. Residential, office, and commercial uses intensify near Downtown Lakeland, the RP Funding Center, and along Florida Avenue. There are hundreds of historical sites, areas, and structures throughout the Study Area, owing to three historically-designated neighborhoods: Dixieland, Munn Park (Downtown), and Lake Hunter Terrace. The Study Area is also host to seven parks, located directly along the Proposed Trail and throughout the neighborhoods. There are some environmental sensitivities along the Proposed Trail relating to the wetlands prevalent throughout the Study Area.

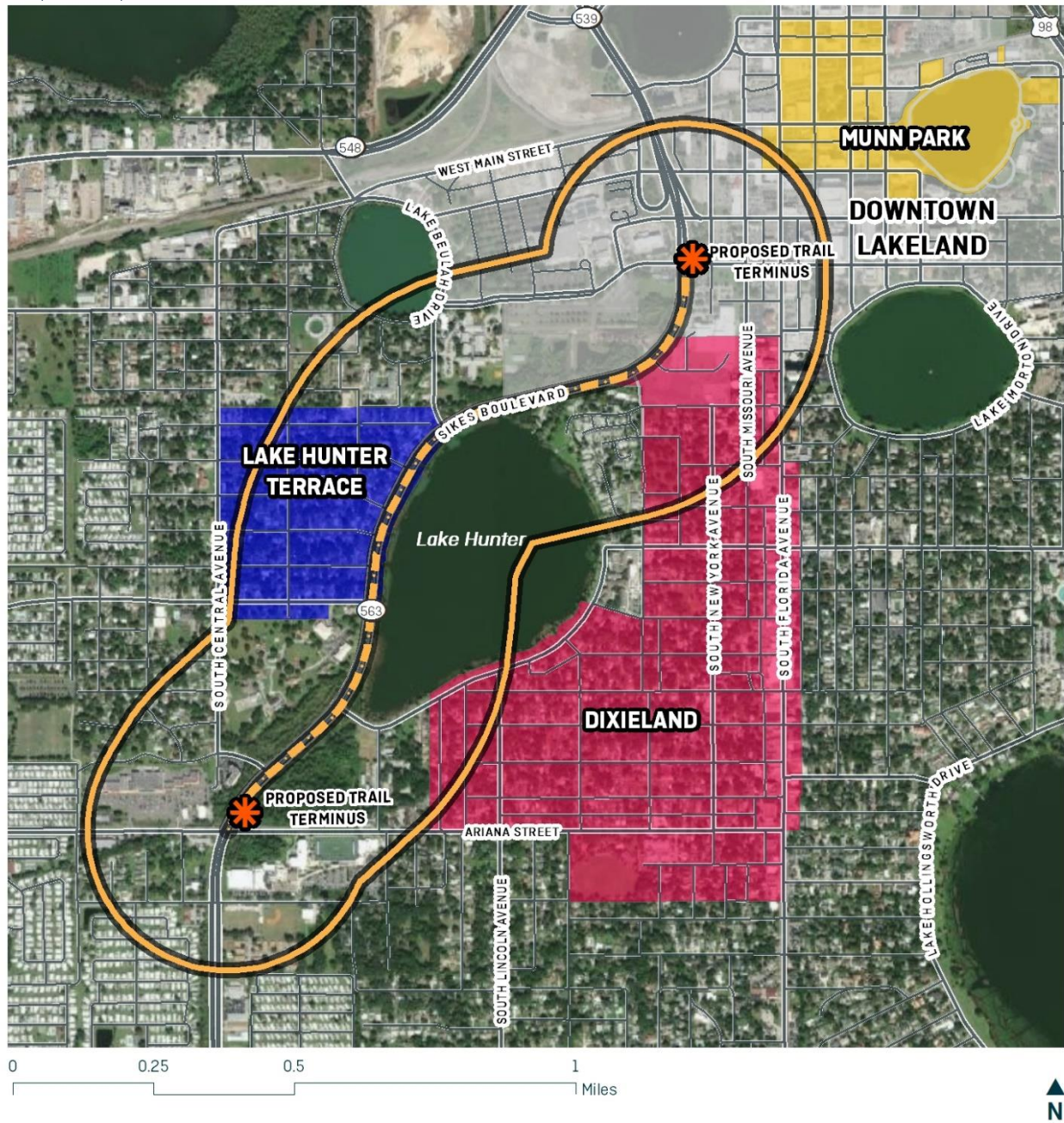
Approximately 19,500 people live in neighborhoods surrounding the Study Area. The median income of the area is \$37,137, which is lower than the Florida median income of \$53,267. A large part of the Study Area falls below the poverty line and is classified as an Environmental Justice group. There is also a substantial number of non-auto dependent people in the neighborhoods surrounding the Proposed Trail.

While there are transit, bicycle, and sidewalk facilities in the Study Area, bicycle facilities are limited along the trail itself, and field observations noted many individuals cycling on the sidewalk. The Study Area's commuting mode split reflects an auto-dominant pattern but areas closer to Downtown display greater mode variation as a result of the more comfortable pedestrian environment.

Figure 1: Lake Hunter (August 2020)



Map 1: Study Area



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Historic Neighborhood (District)	Downtown Lakeland	Proposed Trail
Dixieland	Study Area	Trail Termini
Lake Hunter Terrace		
Munn Park		

Land Use

Zoning & Future Land Use

Current zoning and future land use designations within the Study Area are primarily residential, with some commercial and office use. Table 1 summarizes the study area in terms of both the current zoning and future land use.

Zoning. Residential zoning comprises 67 percent of the Study Area, with single-family zoning and multi-family zoning being the two-largest zoning types by area. Commercial zoning comprises the second-largest category [27%], owing to a variety of businesses operating around the downtown area and a large planned-unit development (PUD) footprint associated with the FBCH + One More Child complex. Office [5%] and industrial [1%] zoning make up the smallest uses by area. Map 2 shows zoning designations in the study area.

Future land use in the Study corridor is also primarily defined by residential uses, comprising 69 percent of the Study Area. Map 3 shows that the proposed Trail is adjacent to several future land use designations, primarily residential. Fifty-one [51] percent of the area is defined as Residential Medium —this is the area encompassing most historic neighborhoods. Seventeen [17] percent of the area is defined as Residential High, indicating a desire for increased densification in the future for most of the area surrounding Downtown Lakeland. The Regional Activity Center designation accounts for 21 percent of the Study Area, covering the area around the RP Funding Center.

Figure 2: Lake Hunter Terrace Sign (August 2020)

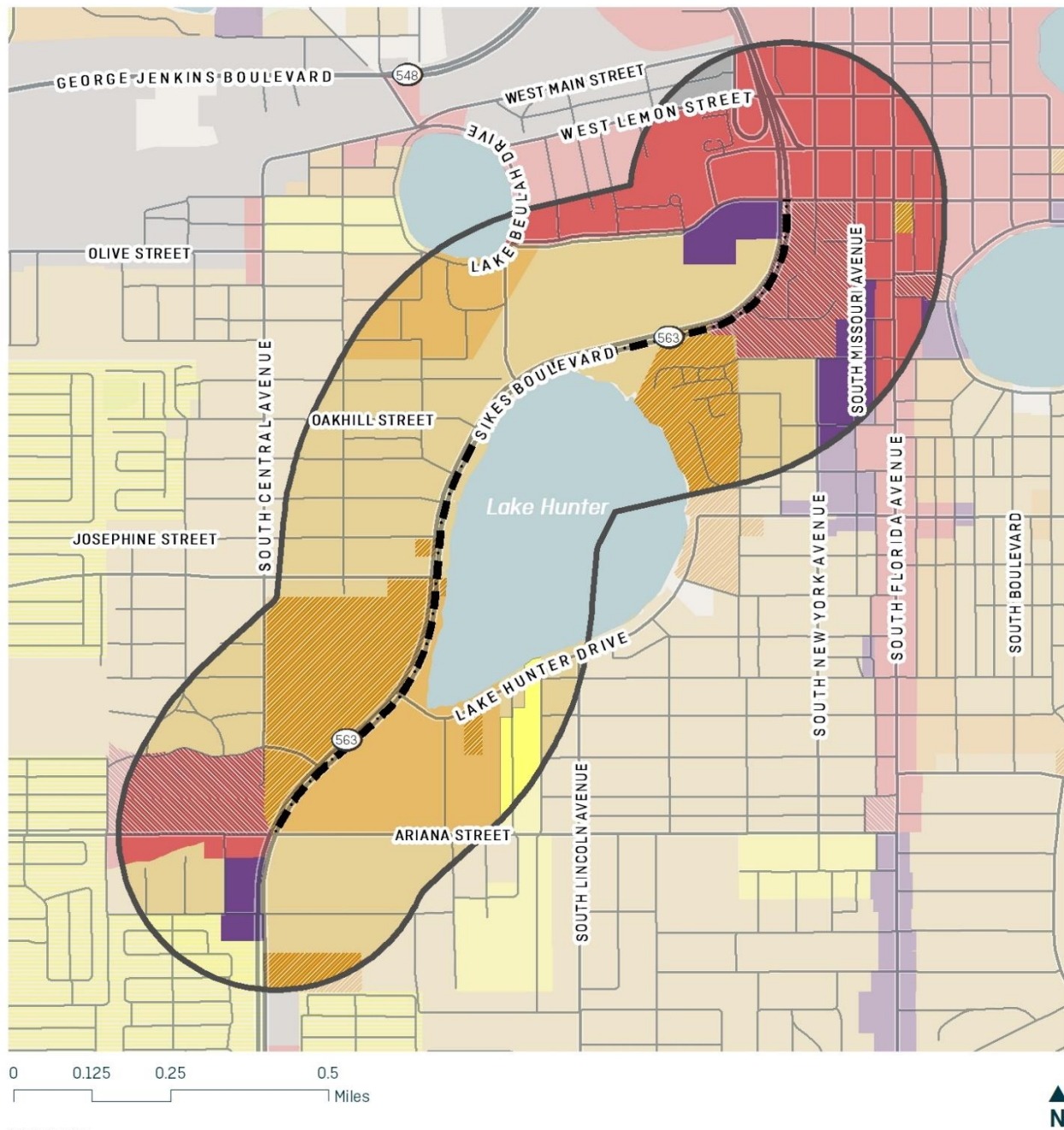


Table 1: Zoning and Future Land Use Summary

Current Zoning			Future Land Use		
Category	Sq. Feet	Share	Category	Sq. Feet	Share
Single Family	8281136	38%	Residential Medium	11158618	51%
Commercial	4023951	19%	Regional Activity Center	4654458	21%
PUD Multi-Family	2993491	14%	Residential High	3771153	17%
Multi-Family	2653800	12%	Neighborhood Activity Center	1140048	5%
PUD Commercial	1910563	9%	Recreation	812275	4%
Office	1011202	5%	Business Park	164547	1%
Mobile Home	362776	2%			
Two Family	300545	1%			
Industrial	164691	1%			
Total	21702155	100%	Total	21701098*	100%

**Differences in totals reflect slightly different boundaries surrounding Lake Hunter.*

Map 2: Zoning

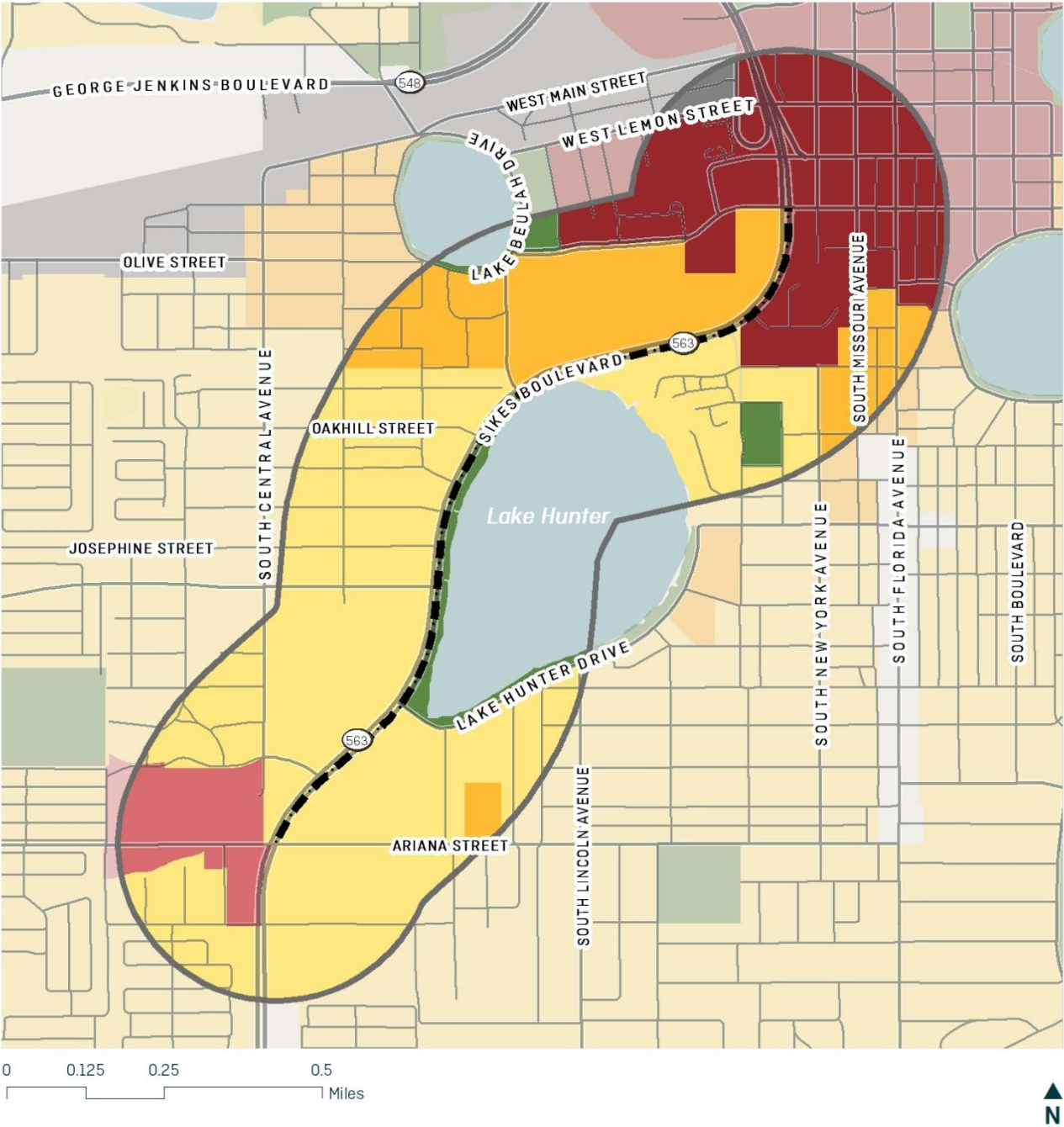


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Current Zoning	Mobile Home	Industrial
Single family	PUD Commercial	Office
Multiple family	PUD Multiple Family	Proposed Trail
Two-family	Commercial	Study Area

Source: City of Lakeland OpenData
City Zoning Atlas (July 2020)

Map 3: Future Land Use



Source: City of Lakeland OpenData
Future Land Use (July 2020)

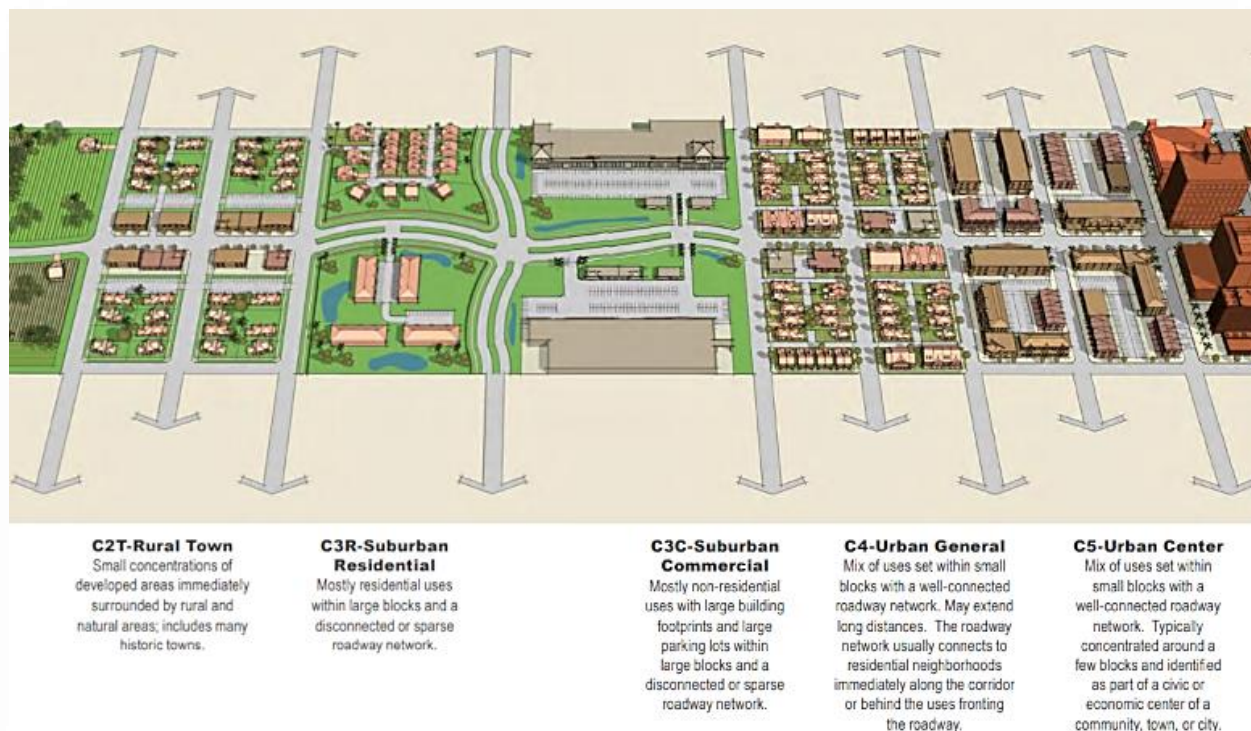
FDOT Context Classification

FDOT uses Roadway Context Classifications to describe development patterns and to support an intentional link between land use and transportation facilities. Figure 3 shows the FDOT Context Classification Transect.

The main thoroughfare, Sikes Boulevard, is classified as **C3C: Suburban Commercial** for the length of the Study Area, indicating a suburban-urban fabric. This is a common designation for larger arterial roadways. North of the study area, the roadway transitions to **C4: Urban General**. This reflects the gridded nature of Downtown Lakeland. South Florida Avenue, which falls in the northern section of the Study Area, is also classified as C4. These facility classifications are shown on Map 4.

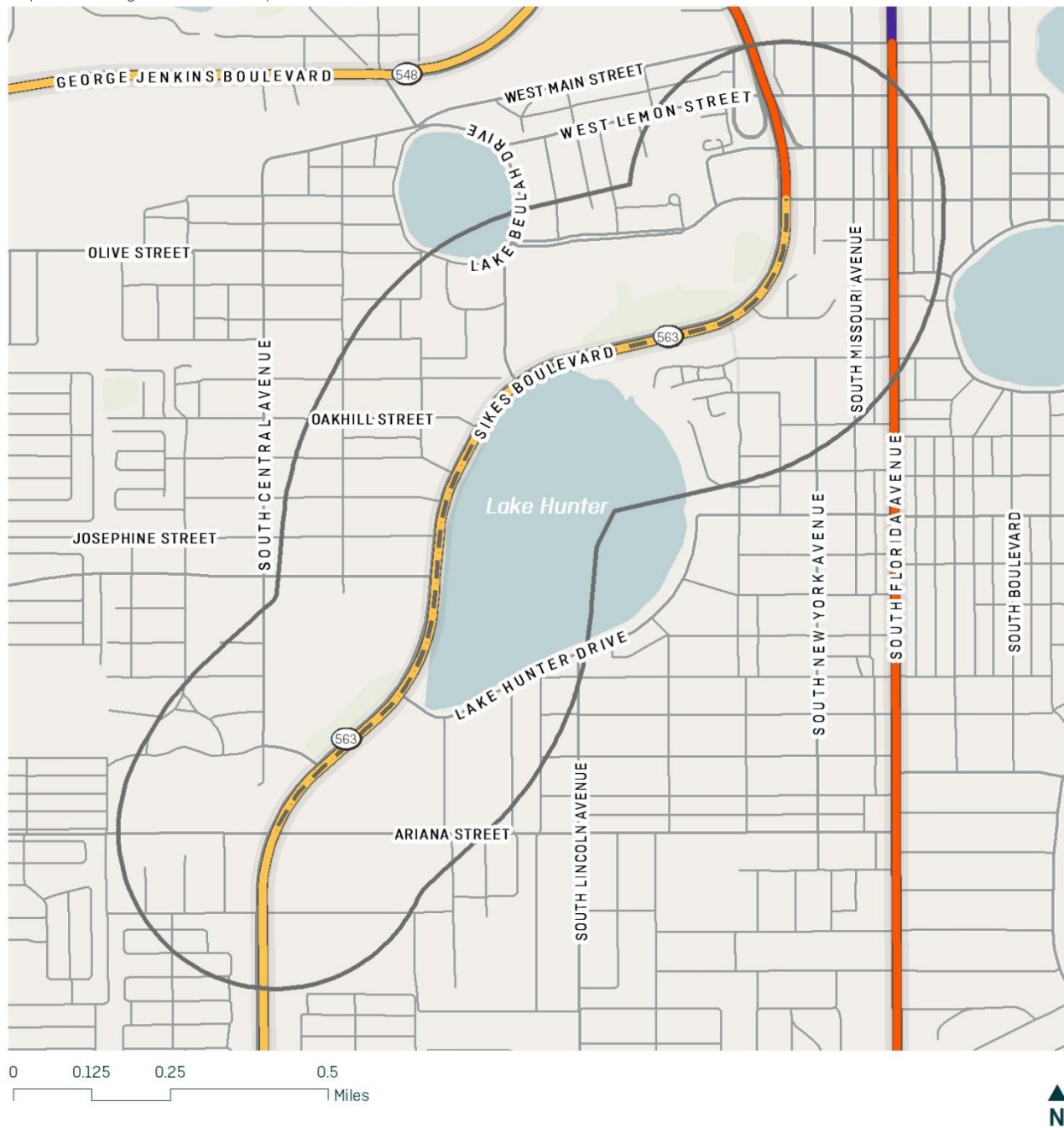
FDOT Context Classification Definitions ¹	
C3C: Suburban Commercial	C4: Urban General
Mostly non-residential uses with large building footprints and large parking lots within large blocks and a disconnected or sparse roadway network.	Mix of uses set within small blocks with a well-connected roadway network ... Usually connects residential neighborhoods immediately along the corridor or behind the uses fronting the roadway.

Figure 3: FDOT Roadway Context Classification Diagram



¹ Definitions and Figure 3 diagram adapted from FDOT Context Classification Guide, 2020 Update.

Map 4: Existing State Roadway Context Classification



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Context Classification	C3R Suburban Residential
C6 Urban Core	Proposed Trail
C4 Urban General	Study Area
C3C Suburban Commercial	

Source: FDOT District One
Existing Roadway Context Classification (2019)

Guiding Community Plans

The Study Area is regulated by a variety of different plans with goals and objectives that generally align with the intent of the proposed Trail by calling for improved pedestrian features and general revitalization.

Lakeland Citywide Pathways Plan. The Pathways Plan², adopted in 2009 and amended in 2012, builds on earlier pedestrian planning efforts in Lakeland dating as far back as 1994. The Plan calls for multi-use trails, dedicated bicycle lanes, sidewalks, and 12-foot wide multi-use trails throughout the City. The Pathways Plan emphasizes connecting community and neighborhood parks, scenic areas and lakeshores, and sporting and recreational facilities through non-motorized means. The proposed West Lake Hunter Trail is included in this Plan [see Figure 4].

Lakeland CRA Downtown Master Plan. The 2009 Lakeland Downtown Master Plan³ updates earlier downtown planning efforts and adds new lenses to the area by establishing sub-districts to guide specific planning efforts. The proposed West Lake Hunter Trail Study Area falls within the “Sports & Events District” and “Southwest District.” The Plan calls for the Sports District to expand existing regional sporting and event options with supportive retail and commercial opportunities, mostly predicated on the RP Funding Center, which is a large multipurpose complex with associated hotel uses nearby. The Master Plan considers options that establish the area as a multi-modal district, with concepts like a downtown shuttle. The Downtown CRA is shown on Map 5.

Lakeland CRA Dixieland Master Plan. The 2002 Plan⁴ focuses on revitalizing the Dixieland neighborhood by improving unsafe conditions. Under *Public Facilities and Services, Goal II*, Objectives 4, 5, and 6, the Master Plan calls for better pedestrian connections that appropriately separate vehicular and pedestrian networks through landscaping, engineering, and buffering. The Dixieland CRA is shown on Map 5.

Lakeland CRA Midtown Master Plan. The Midtown CRA District covers the northwest part of the Study Area [see Map 5]. The 2001 Plan⁵ is focused on improving blighted areas and lowering the crash rate throughout the study area. The Plan references the benefits of developing a bike trail connecting Lake Parker, later realized in the City’s Lake-to-Lake Greenway System. While this trail is separate from the Proposed Trail, they both intend to create a robust, multi-modal network, ultimately consolidated in the Pathways plan.

City of Lakeland Comprehensive Land Use Plan. The Lakeland Comprehensive Plan⁶ identifies the proposed West Lake Hunter Trail via the Lake-to-Lake Greenway System, noting the need for sidewalks and bike lanes in other areas around Lake Hunter. Goal B of the Comprehensive Plan calls for promoting walk- and bikeability, calling for a “healthier, more walkable community for residents of all ages and abilities, to limit greenhouse gases, promote a high degree of mix of land uses and implement a well-integrated transportation system...”

² Lakeland Citywide Pathways Plan. 2009, amended. 2012.

³ Downtown Lakeland Master Plan. 2009.

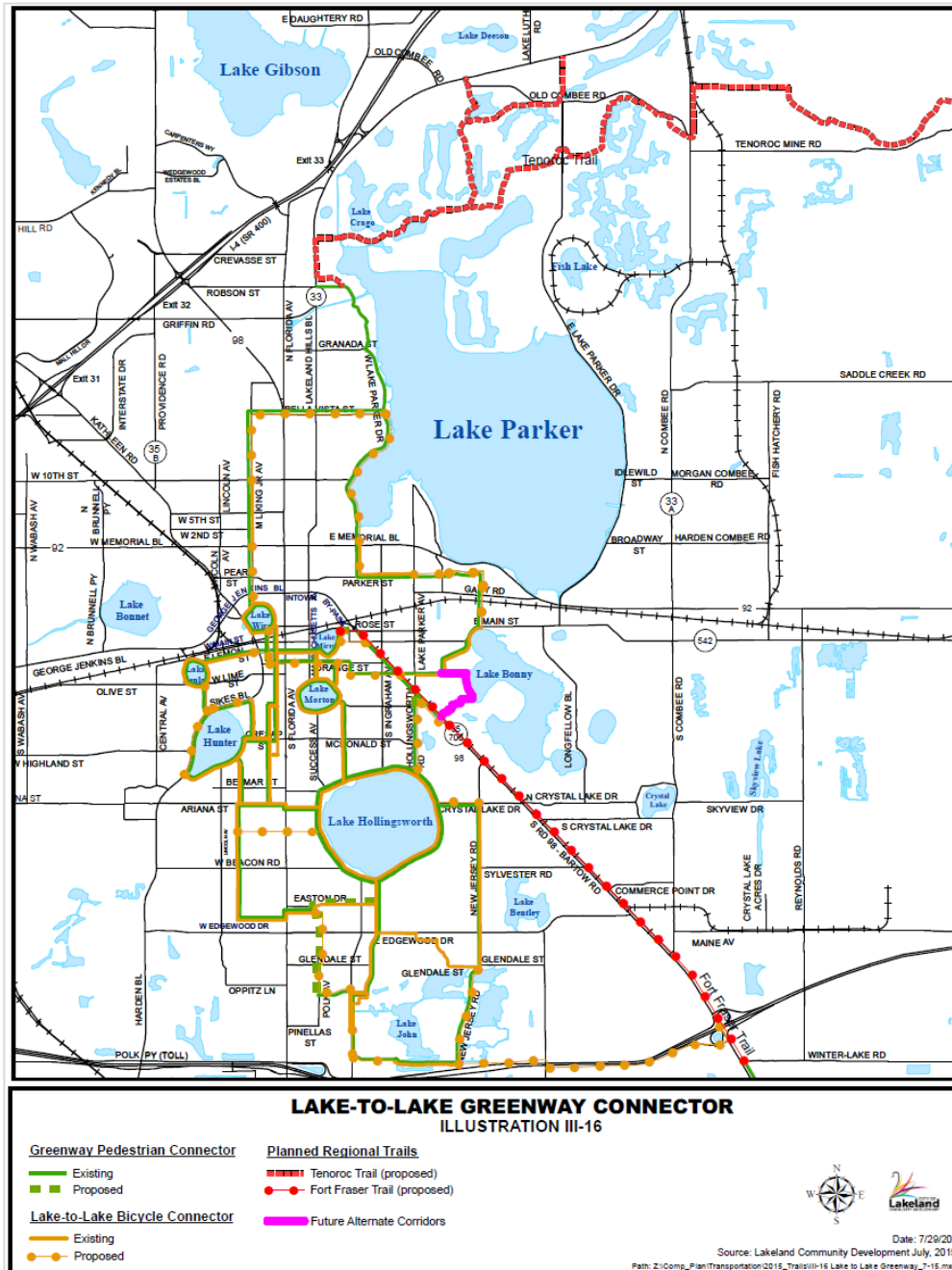
⁴ Dixieland Commercial Corridor Redevelopment Plan City of Lakeland. 2002.

⁵ Lakeland Midtown CRA Master Plan. 2001. Document available from. See Elements III and IV [pgs 43-6].

⁶ Lakeland Comprehensive Land use Plan [2010 – 2020], amended 2018.

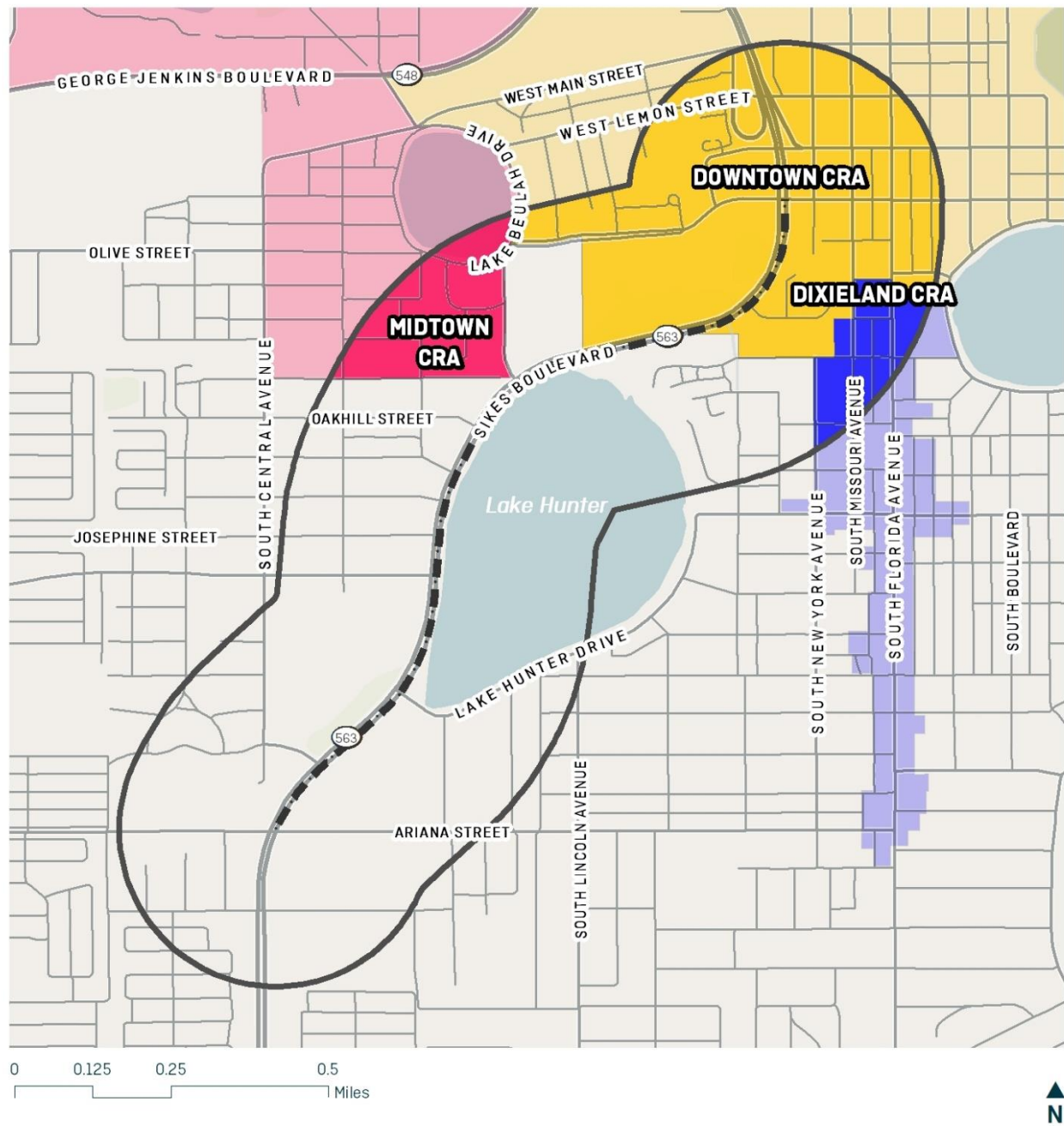
South Florida Avenue Corridor Study. This 2016 Plan does not directly address the proposed Trail but is intended to make South Florida Avenue safer through lane repurposing. The Plan intends to make South Florida Avenue pedestrian-friendly through design treatments such as reducing the roadway from four lanes to two, potentially adding on-street parking, wider sidewalks, and additional shade features⁷.

Figure 4: Lakeland Pathways Plan Illustration III-16 (Lakeland Community Development)



⁷ South Florida Avenue (SR 37) Master Plan Key Findings. 2016.

Map 5: Community Redevelopment Areas



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- | | |
|------------------------------|----------------|
| Community Redevelopment Area | Study Area |
| Dixieland CRA | Proposed Trail |
| Downtown CRA | |
| Midtown CRA | |

Source: City of Lakeland OpenData
Citywide Community Redevelopment Areas (2020)

Transportation Facilities

The sections below discuss major transportation infrastructure, including existing and planned roadways, bicycle and pedestrian facilities, and transit options.

Major Roadways & Traffic

The proposed Trail runs along Sikes Boulevard (SR-563), which is a Class II arterial roadway, four-lane divided, with a posted speed limit varying from 40 MPH to 45 MPH. Sikes Boulevard operates at Level of Service (LOS) D during peak periods and has a current annualized average daily traffic volume (AADT) of 28,400.

Signalized Intersections (see Map 8) along the Proposed Trail:

- Ariana Street and Harden Boulevard/Sikes Blvd (4-way intersection)
- S. Central Avenue and Sikes Boulevard (3-way Intersection)
- Lake Hunter Drive and Sikes Boulevard (3-way Intersection)
- Greenwood Street and Sikes Boulevard (3-way Intersection)
- Hartsell Avenue and Sikes Boulevard (3-way Intersection)
- Lime Street and Sikes Boulevard (4-way intersection)

Stop Controlled:

- Forest Park Street and Harden Blvd (2-way stop controlled).

Signal timing sheets for all the signalized intersections in the Study Area were obtained from the City of Lakeland. The average signal density for Sikes Boulevard is 4.3 signals per mile. Signalization data is reported in Appendix A.

Florida Traffic Online (FTO) provided design-hour factors (K factor) to understand the peak characteristics of the roadway, directional-distribution factors (D factor), and the 24-hour-truck factors (T factor). There are three count stations along Sikes Boulevard, as shown in Table 2.

Table 2: 2019 AADT K factor, D factor, and T factor from FTO

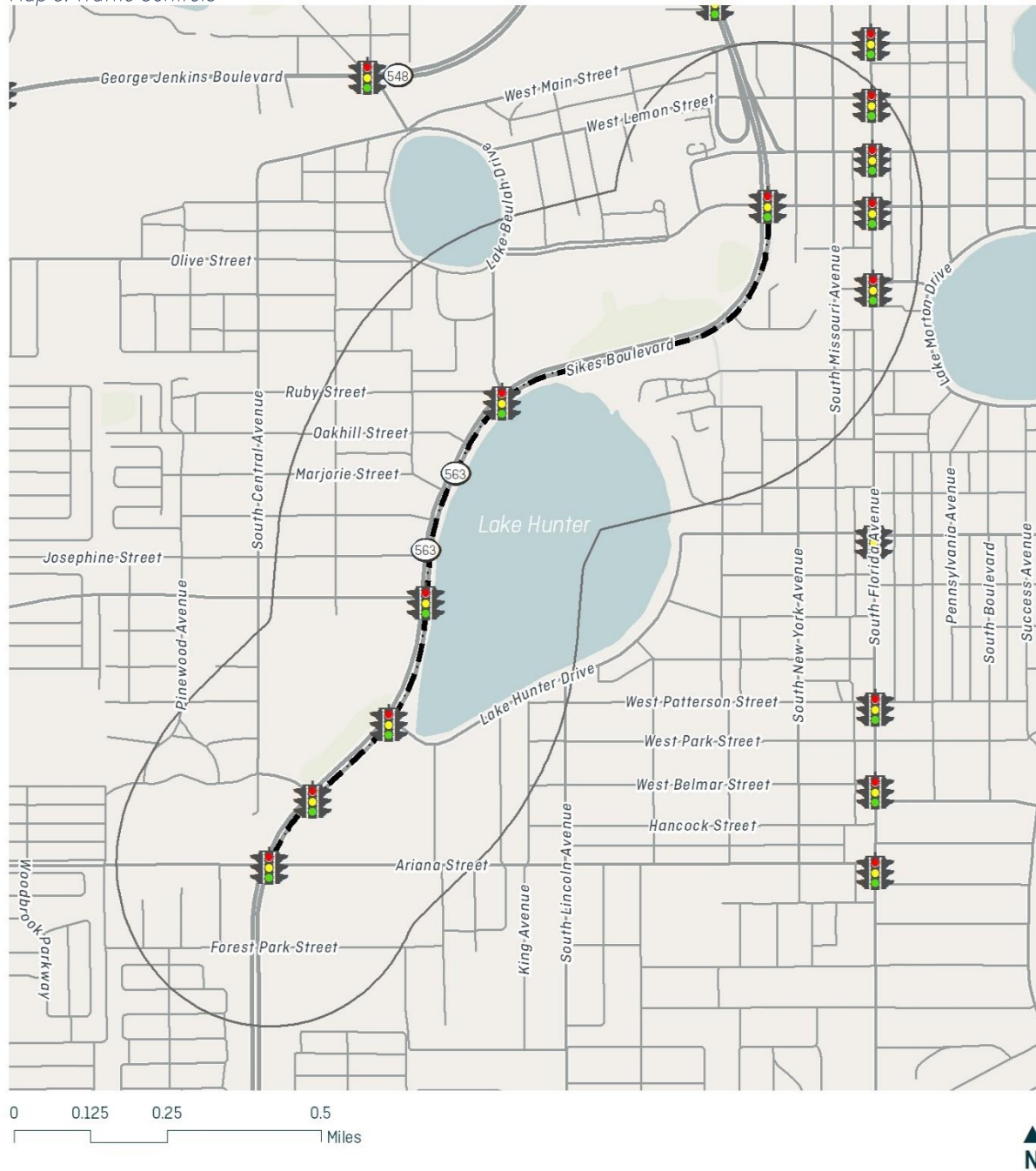
Corridor	Description	K factor	D factor	T factor
Sikes Blvd/SR 563	Northeast of West Ariana Street	9.0	56.0	3.3
	South of West Lime Street	9.0	56.0	3.3
	North of Lime Street	9.0	56.0	3.4

Peak hour volumes in each direction along with combined peak hour volume obtained from FTO are shown in Table 4. AM and PM peak hours were determined from the synopsis reports as 7:30 AM -8:30 AM and 4:30 PM -5:30 PM, respectively.

Table 3: Existing Peak Hour Volumes from FTO

Corridor	Description	Existing Peak Hour Volume (volume/hour)					
		AM		PM		AM	PM
		NB	SB	NB	SB	COMBINED	
SR 563/Sikes Blvd	Northeast of West Ariana Street	1,439	1,154	1,168	1,421	2,593	2,589
	South of West Lime Street	1,377	1,183	1,097	1,357	2,560	2,454
	North of Lime Street	1,268	1,400	1,282	1,226	2,668	2,508

Map 6: Traffic Controls



LEGEND

-  Traffic Signal
-  Proposed Trail
-  Study Area

Source: FDOT GIS Database (2020)
Traffic Controls

Right-of-Way & Property Ownership

Property ownership is heterogeneous within the historic neighborhoods and Downtown, reflecting the prevalence of single-family homes. However, areas outside those neighborhoods tend to have larger holdings, owing to more institutional uses, such as the RP Funding Center, R.W. Blake Academy, and the Lakeland Ledger. The City of Lakeland owns the largest amount of land, distinguished in blue on Map 7.

Sikes Boulevard is a state road. Most other roadway facilities throughout the Study Area are maintained by the City of Lakeland, but there are a few private roads. Roadway ownership is shown on Map 8.

Crash Statistics and Safety

From 2015 to mid-2019, 211 car crashes were recorded in the Study Area, 59 of which were directly along the proposed Trail. Six (6) involved pedestrians, none of which were fatal. Four (4) crashes involved cyclists, one of which was fatal. The fatal incident occurred at the intersection of Sikes Boulevard and Ariana Street at the southern end of the proposed Trail. The average crash rate per million AADT is 0.761%. Crash locations are shown on Map 9 and Map 10.

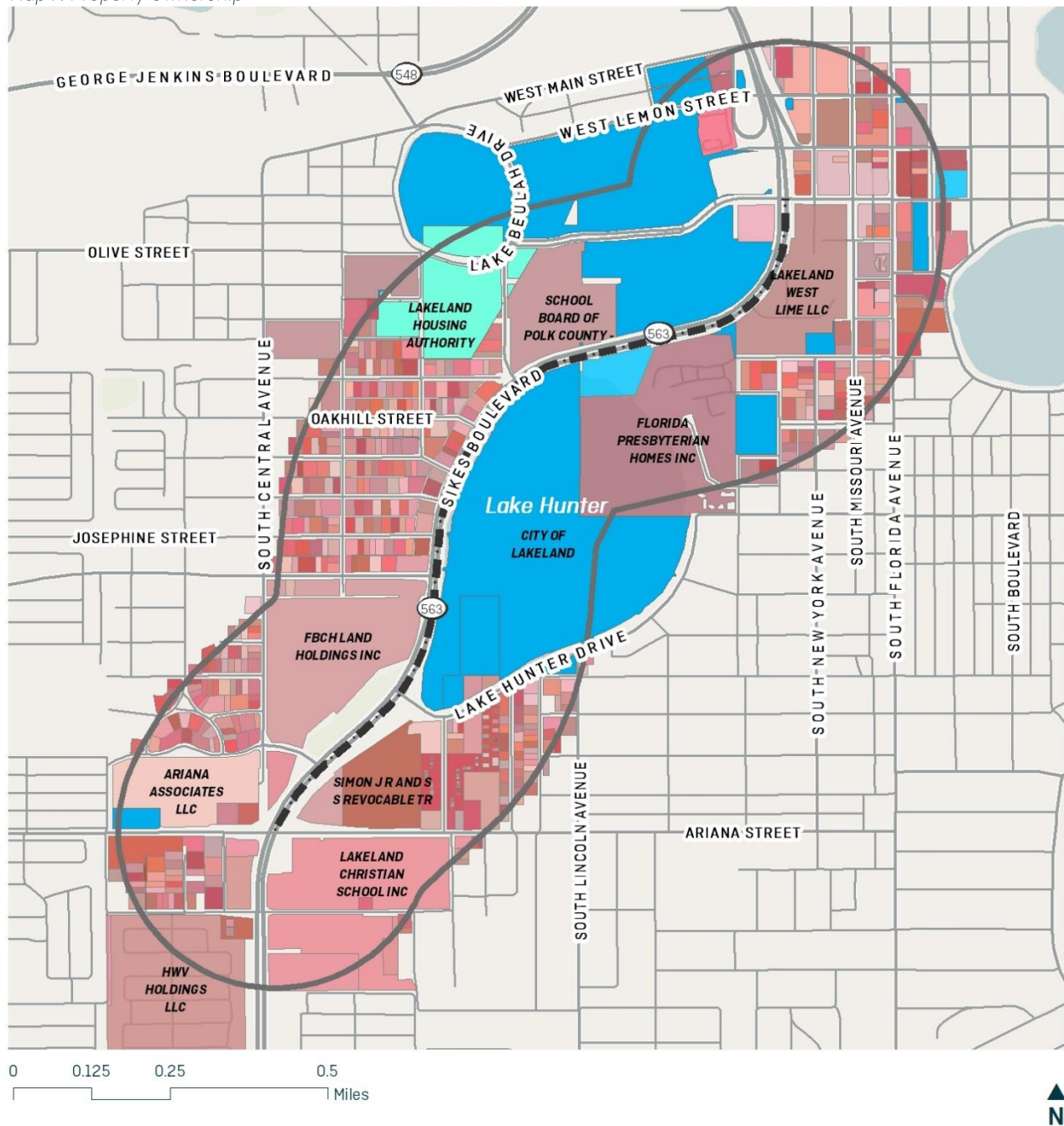
Figure 6: Sidewalk Along Lake Hunter, Looking South (August 2020)



Figure 5: Person Walking Along Sikes Boulevard Looking North (August 2020)

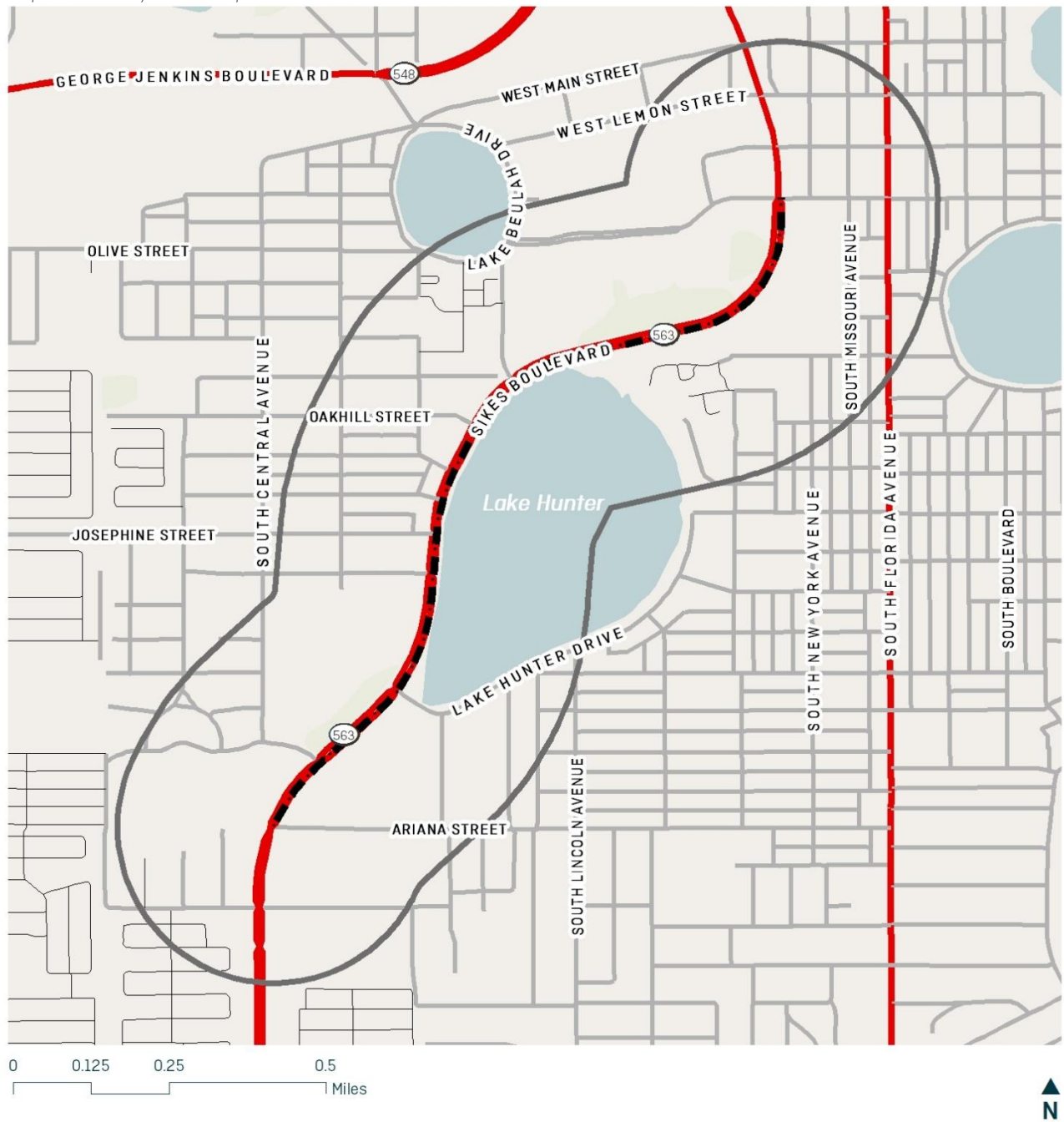


Map 7: Property Ownership



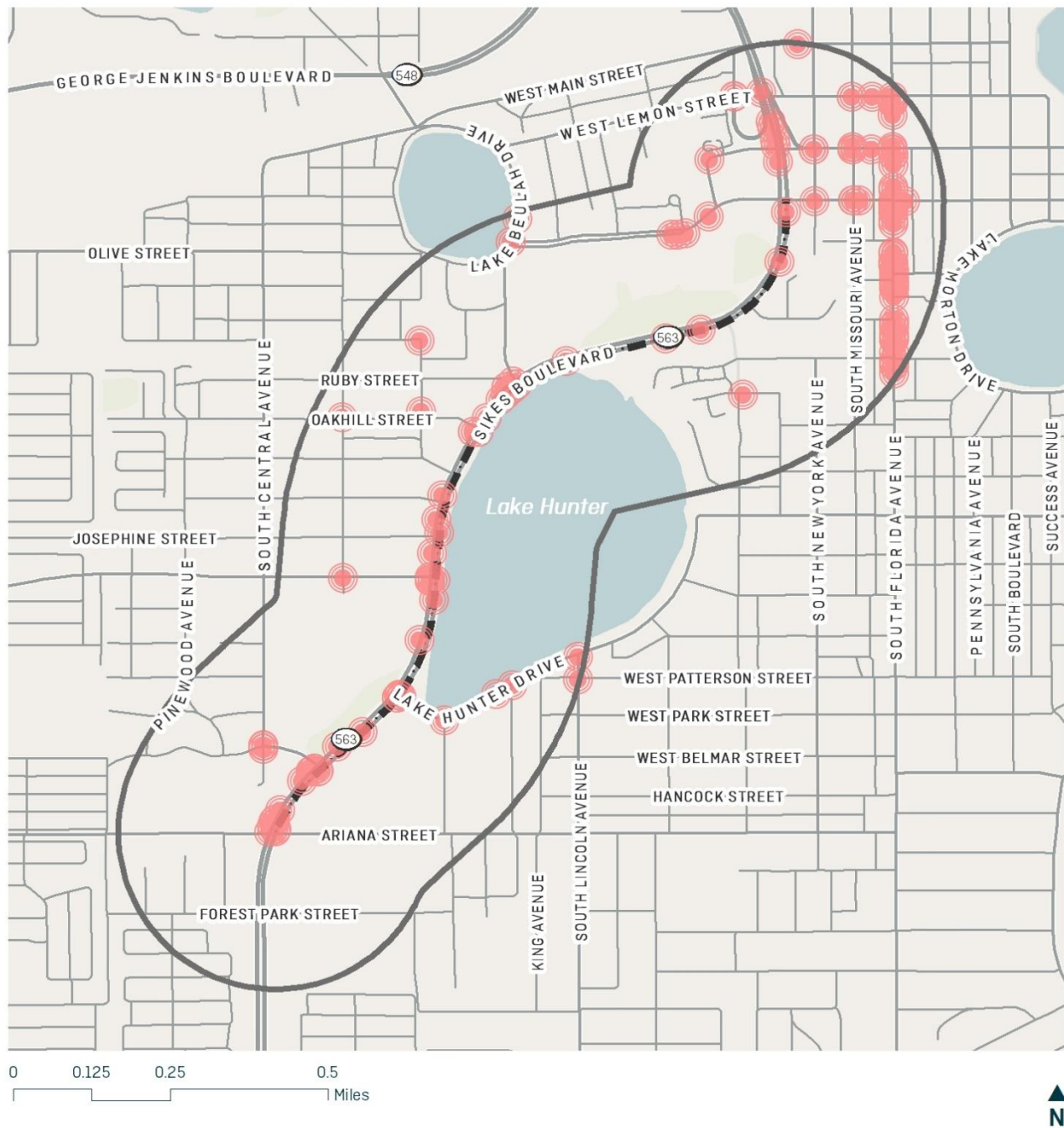
Source: Polk County Property Appraiser
Current Parcel Boundaries and Property Ownership (2020)

Map 8: Roadway Ownership



Source: City of Lakeland OpenData
Street Centerlines (2020)

Map 9: Crashes Not Involving Pedestrians or Cyclists

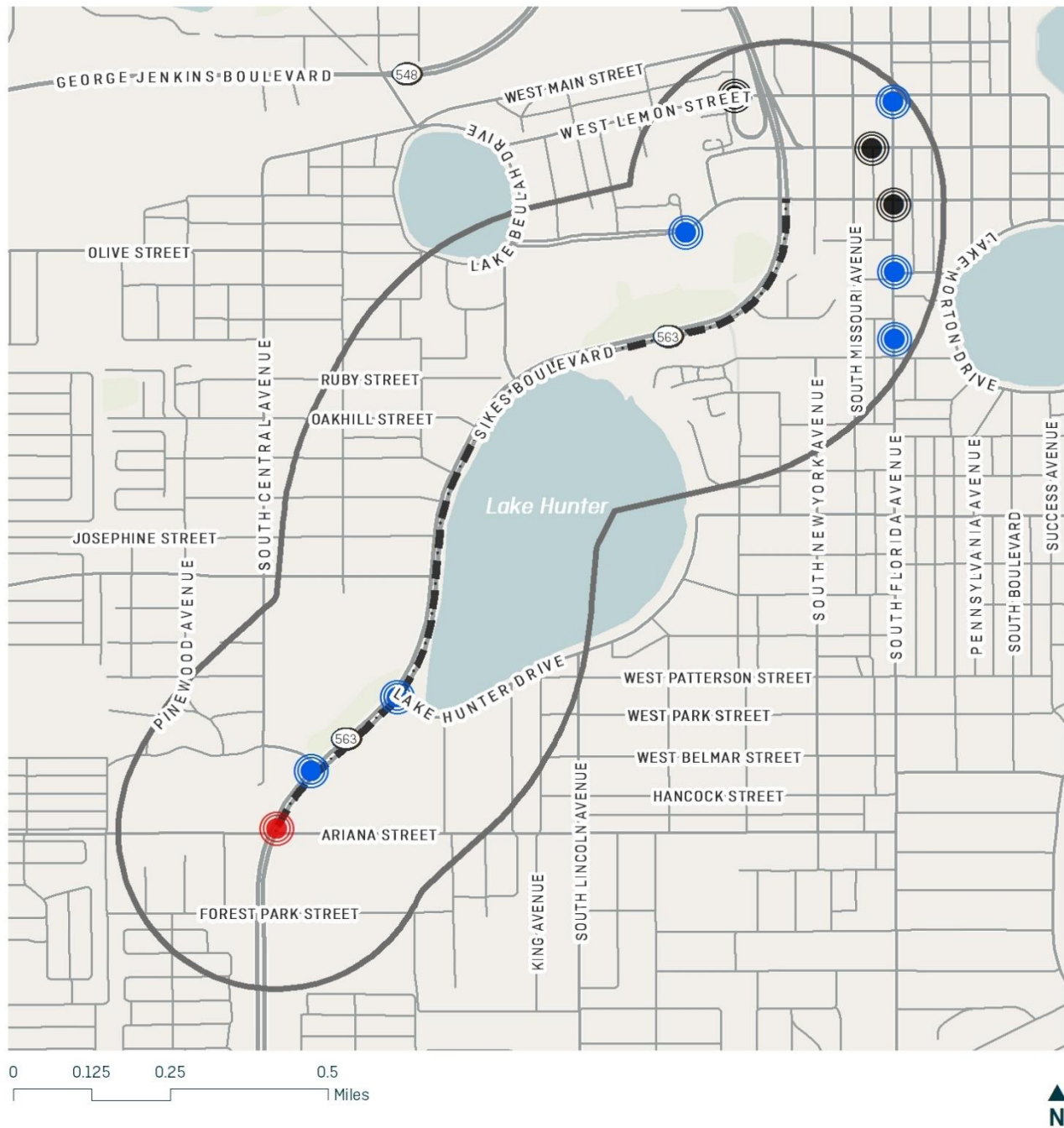


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- Automotive Crash (Non- Bike/Ped)
- Study Area
- Proposed Trail

Source: FDOT Crash Database
2015 - Mid-2019

Map 10: Crashes Involving Pedestrians or Cyclists



LEGEND

- Pedestrian Crash, Nonfatal
- Bicycle Crash, Fatal
- Bicycle Crash, Nonfatal
- Study Area
- Proposed Trail

Source: FDOT Crash Database
2015 - Mid-2019

Transit Service

Citrus Connection is the primary transit provider in Polk County and operates five routes (Gold, Green, Orange, Peach, and Red), serving 24 bus stops, in the Study Area. The main route along the proposed Trail is the Orange Route, with six stops along Sikes Boulevard adjacent to the proposed Trail. One stop at the southwest end of the proposed Trail serves the Red route. Bus stops along the east side of Sikes Boulevard (along the Proposed Trail) are all “sign only” stops, like those shown in Figure 7. Two of the three stops on the opposite side of the roadway have benches, but no shelters or other amenities.

For the last quarter of 2019, boardings for the stops along the proposed Trail averaged less than ten riders per day. Map 11 displays current transit service within the Study Area as of January 2020, and Table 5 shows transit service characteristics for those routes.

Table 4: Transit Service Characteristics

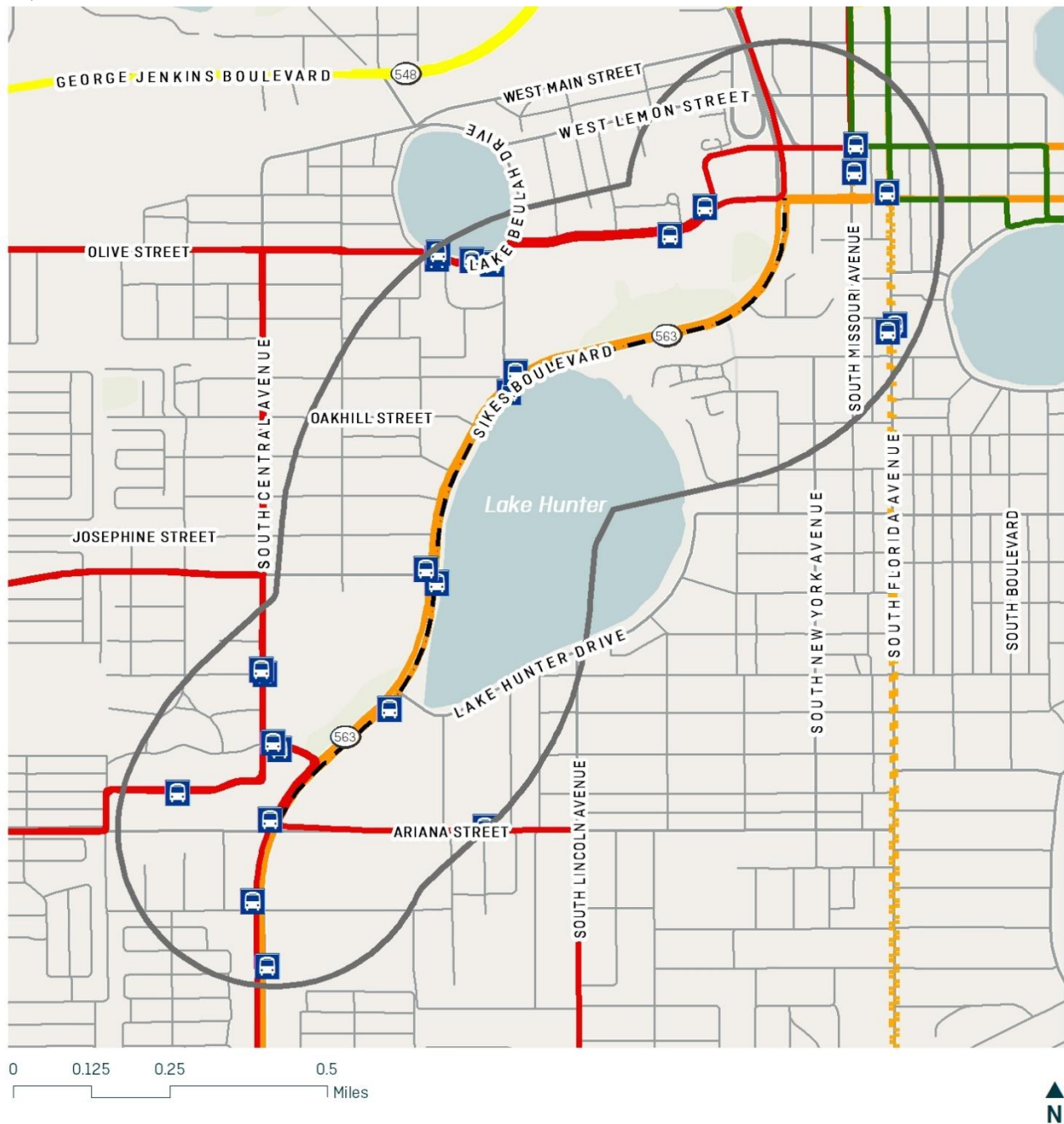
Route	Weekday Hours	Headways	Weekend	Connections
Orange 1 (NB)	5:45 AM – 6:25 PM	90 minutes AM & PM Commute	No Service	Blue, Gold, Green, Lime Flex, Pink, Purple, Red, Silver, Yellow
Orange 2 (SB)	8:00 AM – 7:36 PM			
Red 1 (SB)	5:45 AM – 6:35 PM			Blue, Gold, Green, Orange, Pink, Purple, Silver, Yellow
Red 2 (NB)	8:00 AM – 7:29 PM			

Many Citrus Connection routes can be accessed through the Downtown Lakeland Terminal, a key transfer point located one-half mile from the northern end of the Study Area. For regional and intercity access, the Lakeland Amtrak & Greyhound Terminals are co-located on the northeast side of downtown, less than one mile from the northern end of the Study Area.

Figure 7: Citrus Connection sign stop along the Proposed Trail, Looking North (August 2020)



Map 11: Transit Service



LEGEND

CitrusConnection Routes	Red	Study Area
Gold	Yellow	
Green	Active Bus Stops	
Orange	Proposed Trail	

Source: Citrus Connection
GTFS Feed (January 2020)

Bicycle and Pedestrian Facilities

Downtown Lakeland has several bicycle and pedestrian facilities, and the City plans to connect most lakes within the downtown area through the Lake-to-Lake Greenway System. Several portions of this system have been completed, including the nearby trail surrounding Lake Hollingsworth, Lake Mirror, and Lake Wire, as well as trails along North Florida Avenue and West Edgewood Drive. Several upcoming multimodal trail facilities are planned as part of this effort, including the Main Street Bike Trail, Mall Hill Drive, West Lake Parker Drive, and Westgate-Central Trail.

In the Study Area, the New York Avenue Cycle Track (Figure 9) and Lake Hunter Trail, along the Lake's eastern edge, both serve the northern and eastern areas of the Study Area, and there is bicycle infrastructure around Lake Beulah and the Dixieland neighborhood. Despite surrounding bicycle facilities, there are no bicycle lanes or multi-use trails within the Study Area on Sikes Boulevard. Most roadways have at least 5-foot sidewalk sections, although some are up to eight-feet wide (visible in Figure 7).

Some residential neighborhoods do not have any sidewalks; most of these are brick-lined streets in the surrounding historic neighborhoods. Existing pedestrian infrastructure is shown on Map 12, along with the City of Lakeland's current and proposed trails and bike paths.

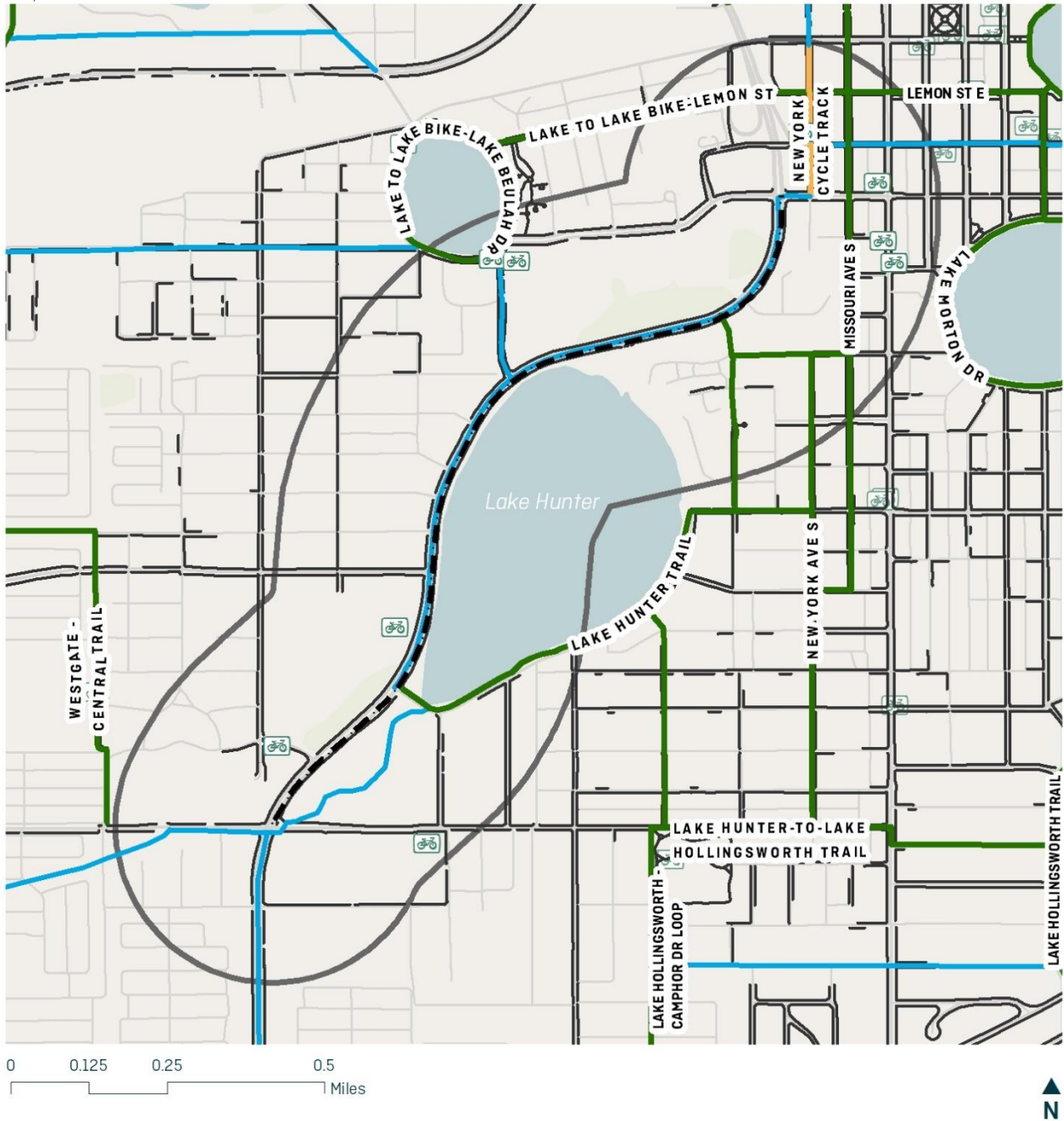
Figure 8: Pedestrian Call Button Along Sikes Boulevard (August 2020)



Figure 9: Terminus of New York Avenue Cycle Track (August 2020)



Map 12: Non-motorized Infrastructure (Current and Planned)



LEGEND

- | | |
|---|----------------|
| Lakeland Bike & Ped Pathways | Bicycle Racks |
| Existing | Sidewalks |
| New York Cycle Track | Proposed Trail |
| Proposed | Study Area |

Source: City of Lakeland OpenData
Bike & Pedestrian Facilities (July 2020)

Demographics

An area representing the neighborhoods surrounding the Proposed Trail was identified using existing neighborhood and community contours to identify the population most likely to use the Proposed Trail. Statistics for that group are represented using Census block groups and supporting sources, including the Streetlight platform.

Common Indicators

General, racial, and commuting statistics appear in Table 5. Approximately 19,337 people live in the neighborhoods surrounding the Study Area. This group has a median age of 39.8, somewhat younger than Florida's median age of 42 [Map 13].

The area is racially diverse. Approximately 19 percent identify as something other than "white alone." White alone is the largest racial identifier (81%), followed by Black alone (16%). Those identifying as Hispanic-Latino are reported tabulated separately from racial categories by the Census; the Hispanic-Latino population makes up sixteen percent (16%) of the area. Summary statistics on race appear in Table 5 and are displayed in Map 15.

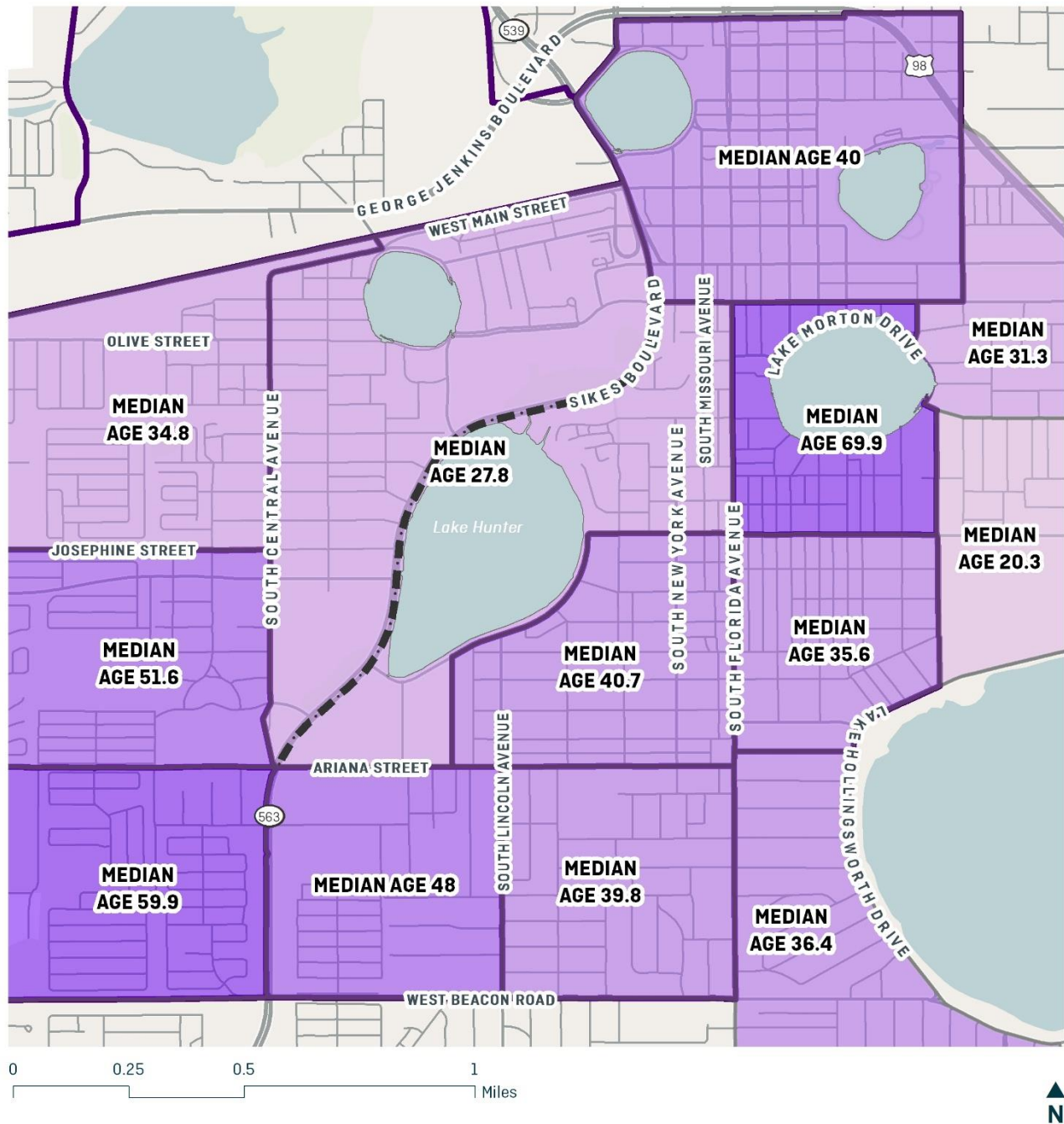
The median income in the neighborhoods surrounding the Proposed Trail is \$11,363 less than Polk County's median income of \$48,500. The lowest-income block groups in the Study Area are those directly surrounding the Proposed Trail [Map 14]. Of the 19,337 individuals in the area, 7,404 are employed [Map 16].

Environmental justice (EJ) is a doctrine of fair treatment of people without regard to background or socioeconomic status. Most of the Study Area is identified as having an EJ status due to large minority and poverty populations. Map 17 displays EJ populations by Census block groups for the neighborhoods surrounding the Study Area.

Table 5: Summary Socio-economic Statistics

Racial Breakdown			Mode to Work			General Statistics	
Asian & Pacific Is.	204	1%	Drove Alone	5,868	79%	Median Income	\$37,137
Black & Afr. Amr.	3,053	16%	Carpool	1,188	16%	Median Age	39.8
Hispanic-Latino*	3,001*	16%	Transit	18	0%	0-Vehicle Households	876
Native American	143	1%	Walk	213	3%	Data based on the 2018 US Census American Community Survey (ACS).	
Other Identity	243	1%	Bike	117	2%		
White	15,135	81%				*The US Census Bureau does not report Hispanic-Latino as a racial category.	
Total population	19,337	-	Total	7404	100%		

Map 13: Median Age

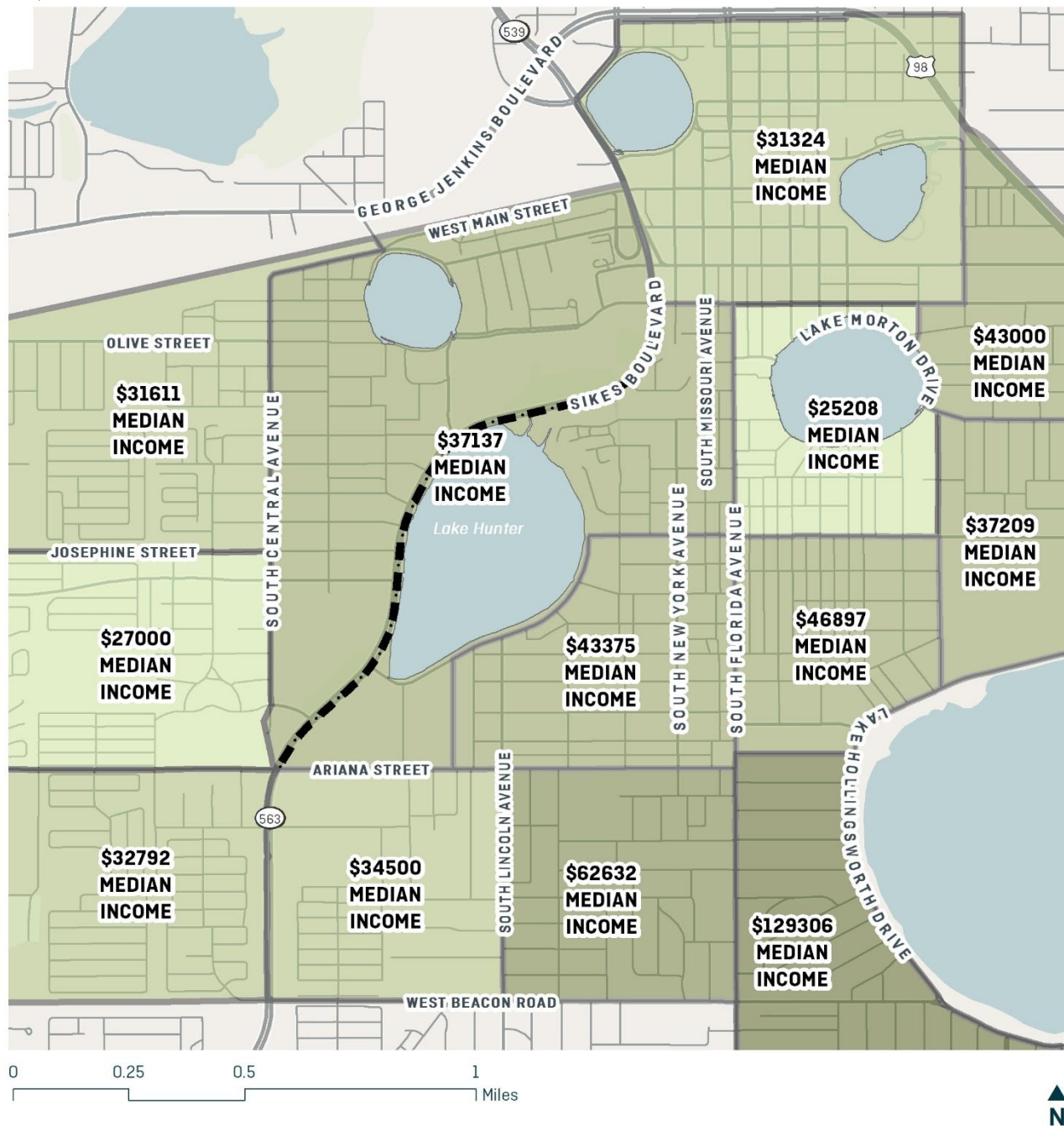


LEGEND

Median Age	36 - 45	Proposed Trail
20 - 25	46 - 55	
26 - 35	70	

Source: US Census Bureau (2018)
ACS Table: B01002

Map 14: Median Income

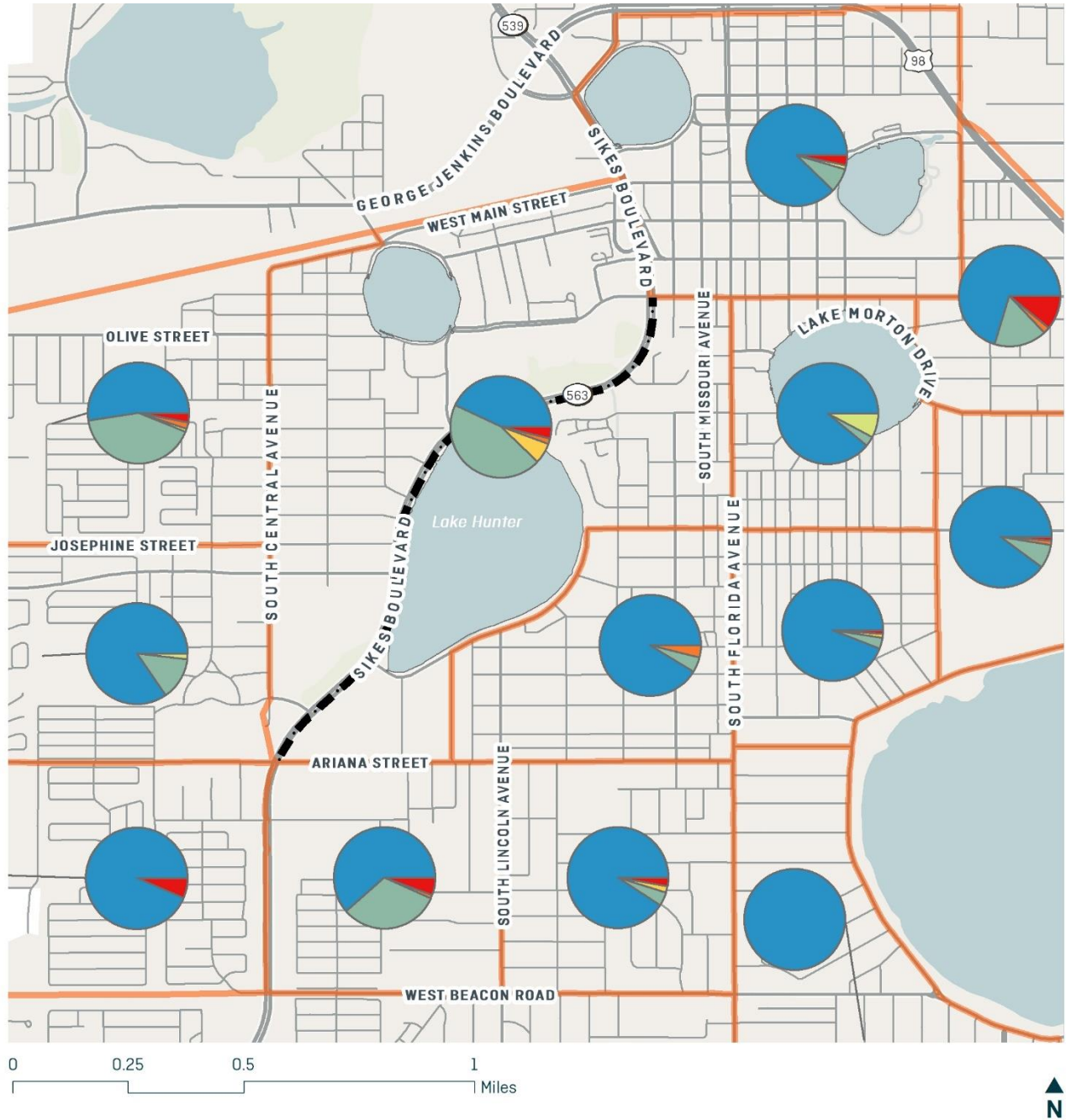


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Median Income	\$35,000.01 - \$50,000.00	Proposed Trail
\$25,208.00 - \$27,000.00	\$50,000.01 - \$65,000.00	
\$27,000.01 - \$35,000.00	\$65,000.01 - \$130,000.00	

Source: US Census Bureau (2018)
ACS Table: S1901 (1-Year Inflation Adjusted)

Map 15: Racial Breakdown



LEGEND

Racial Identity



White Alone
Black Alone
Native Alone

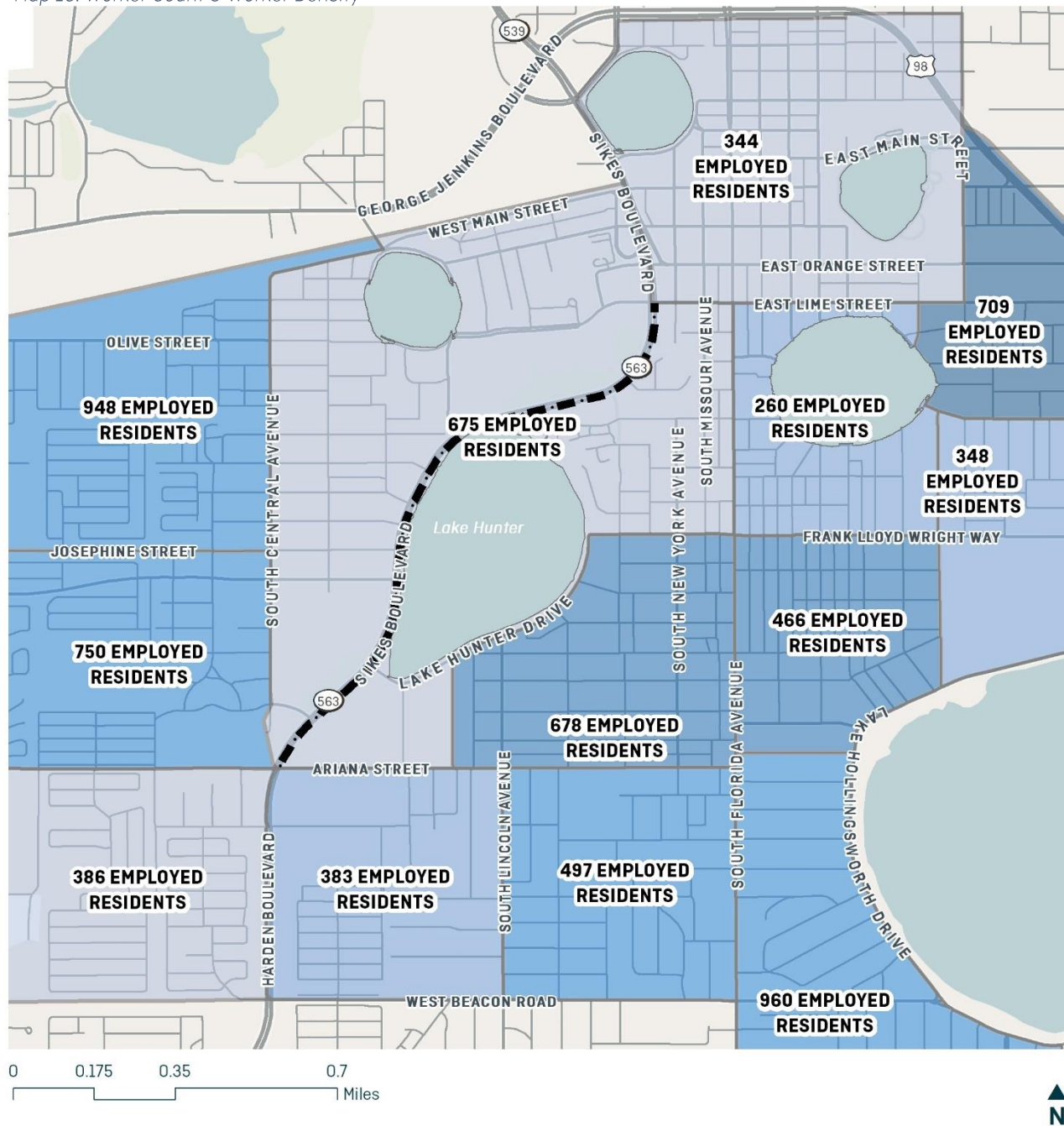
Asian Alone
Other Alone

Proposed Trail

Two or More Races

Source: US Census Bureau (2018)
ACS Table: B02001 (1-Year Detailed)
*Latin population reported separately

Map 16: Worker Count & Worker Density



LEGEND

Employment Density per Acre

1 - 1.9

2 - 2.9

3 - 3.9

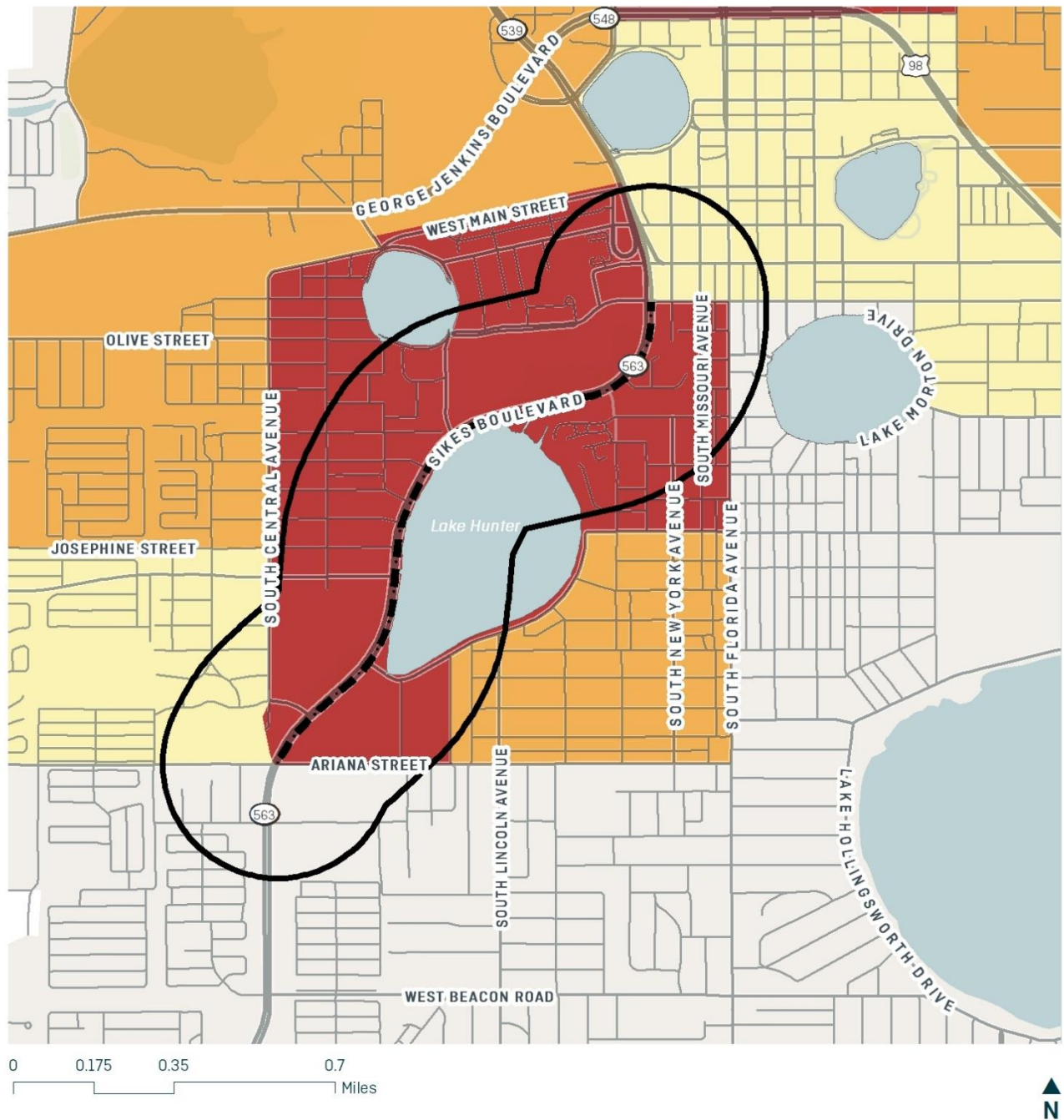
4 - 4.9

5 - 5.5

--- Proposed Trail

Source: US Census Bureau (2018)
ACS Table: S2301 (1-Year Detailed)

Map 17: Environmental Justice Populations



LEGEND

- Pop Below Poverty + Hispanic / Non-White Population [1]
- Hispanic / Non-White Pop [2]
- Population Below Poverty [3]
- Study Area
- Proposed Trail

[1] Includes information from both #2 and #3 below

[2] Areas with 175%+ of the County Average for Non-White Population (EJ Threshold 35.18%) (Polk Average 20.1%)

and/or Areas with 175%+ of the County Average for Hispanic Population (EJ Threshold 33.25%) (Polk Average 19%)

[3] Percent population below poverty level 175%+ of the County Average (EJ Threshold 31.85%) (Polk Average 18.2%)

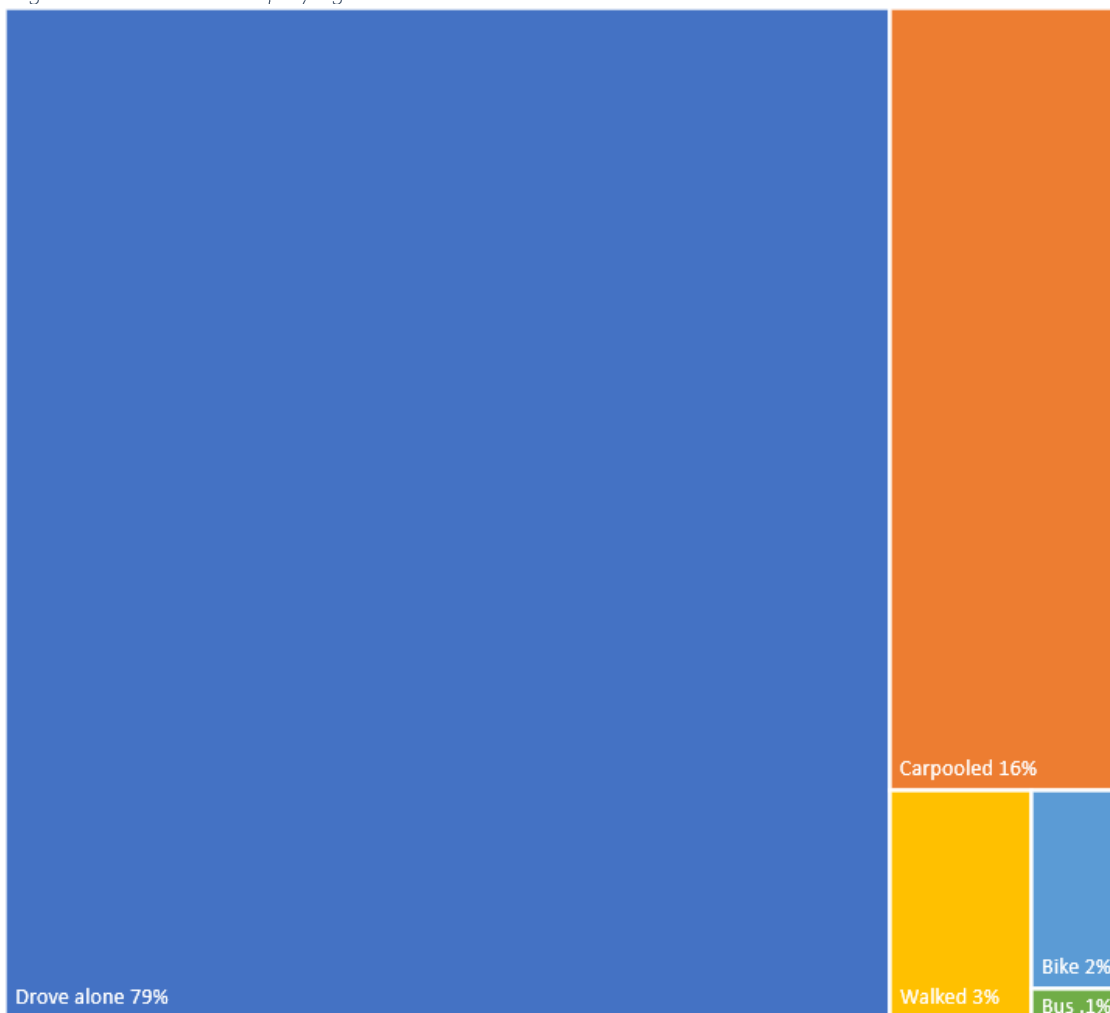
Transportation Choices

The area chart below (Figure 10) displays the mode choice split for the neighborhoods surrounding the Study Area as reported by the Census ACS. Because the ACS reports only *commuting* trips, Streetlight data in the next section supplements this data.

Most individuals within the Study Area (approximately 95% - 5,868) use a private automobile for their commute. Most drive alone (79% - 5,868), although a substantial proportion carpool (16% - 1,118). Less than six percent (6% - 348) use some other mode, like walking, cycling, or motorcycle. Map 18 shows the geographic distribution of commuting patterns. Approximately 876 households within the neighborhoods surrounding the Study Area are zero-vehicle households (Map 19).

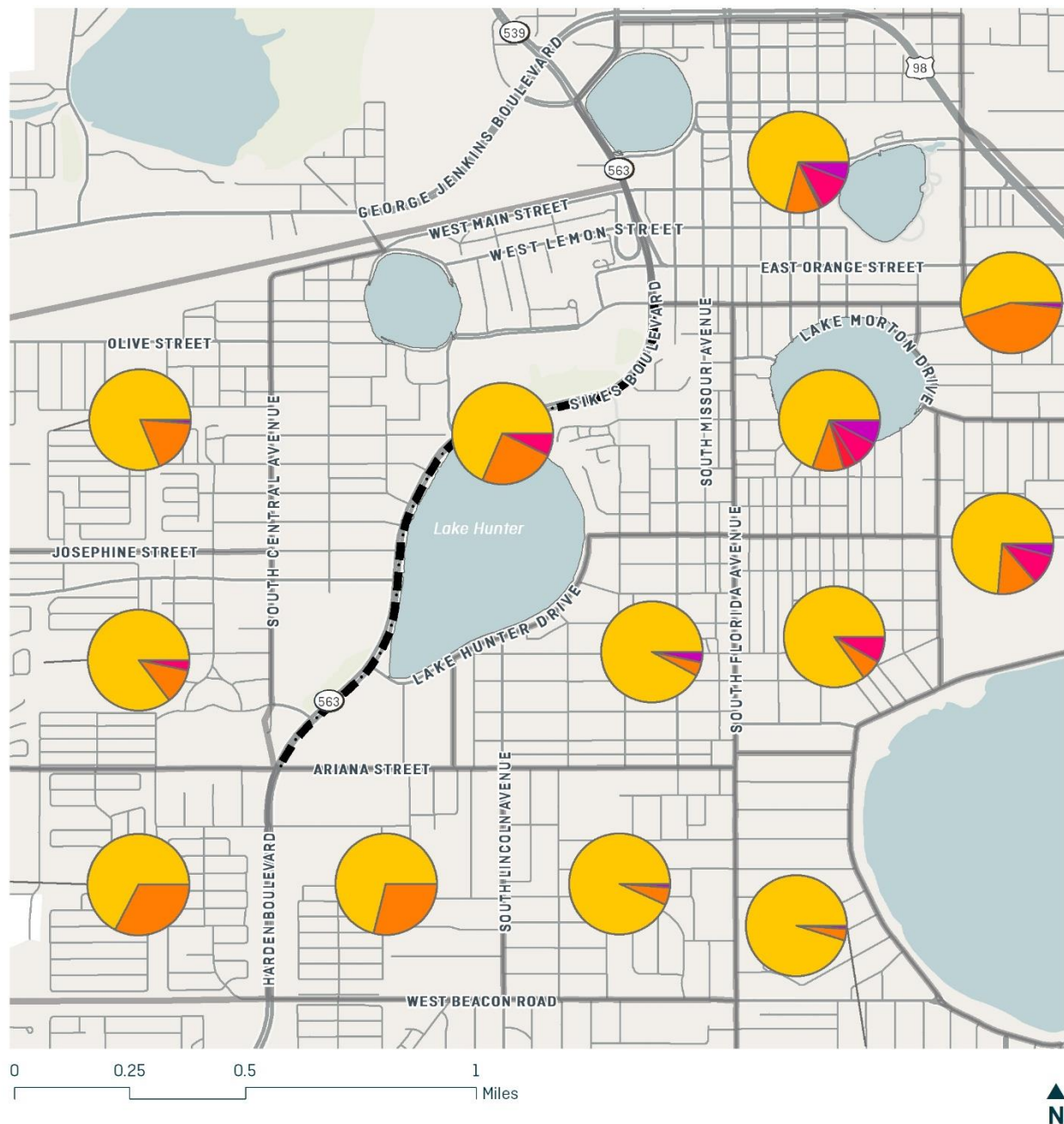
In the Lake Hunter area, transportation costs make up a larger percentage of household expenditures than do housing costs⁸. The Center for Neighborhood Technology estimates that the neighborhoods surrounding the Study Area have a combined transportation and housing burden of 44 percent (44%), with 21 percent (21%) for housing and 23 percent (23%) for transportation costs.

Figure 10: Area Chart Displaying Mode Choice to Work



⁸ Center for Neighborhood Technology, H + T Burden Map. Accessible from: <https://htaindex.cnt.org/>.

Map 18: Mode Choice to Work



LEGEND

Mode to Work



Drove Alone

Carpooled

Public Transit

Walked

Biked and Other

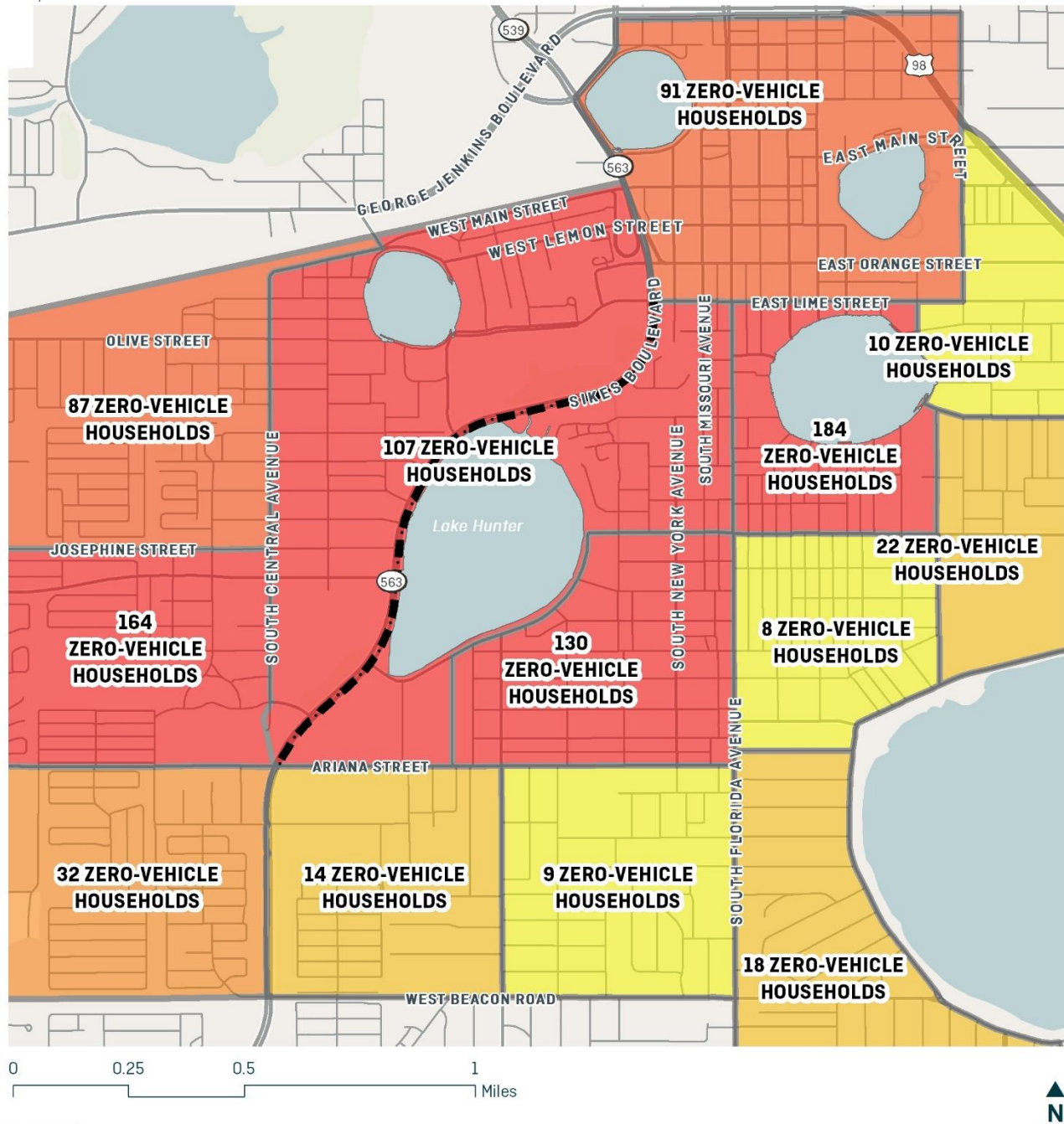
Proposed Trail

Source: US Census Bureau (2018)

ACS Table: S0801 (1-Year Detailed)

*Cycling is grouped with other modes including motorcycling.

Map 19: Zero-vehicle Households



Source: US Census Bureau (2018)
ACS Table: B08014 (1-Year Detailed)

Detailed Bike/Ped Analysis

To supplement Census transportation statistics, the Streetlight platform provides estimations for trip characteristics generated from anonymized cellphone data. The period studied ranged from mid-2018 to mid-2020, covering pre- and post-COVID-19 periods and included cycling and pedestrian flows.

Downtown Lakeland, Dixieland, and South Beacon Hill are the top bicycle trip generators in the area (Table 6 and Map 20). These figures are substantially higher than the commuting-only, survey-based trips estimated by the Census Bureau; Streetlight estimates an average bicycle trip generation rate of 1,315 in the area, whereas the Census estimates that only 117 of these trips are for commuting to work (Figure 10). Weekends generate more bike trips than weekdays, and 10 AM – 3 PM (Table 7) is the most popular trip time, all of which suggest that most bike trips are for recreation or exercise.

School bicycle trips (Lakeland Christian Academy and the Blake Academy) produce very few bicycle trips, regardless of period. While one might expect production to be higher in the PM peak, which students and staff are leaving school, this period is also very low. This suggests that students and staff walk, take the bus, or drive to-and-from school.

Table 6: Streetlight Bicycle Trip Generation

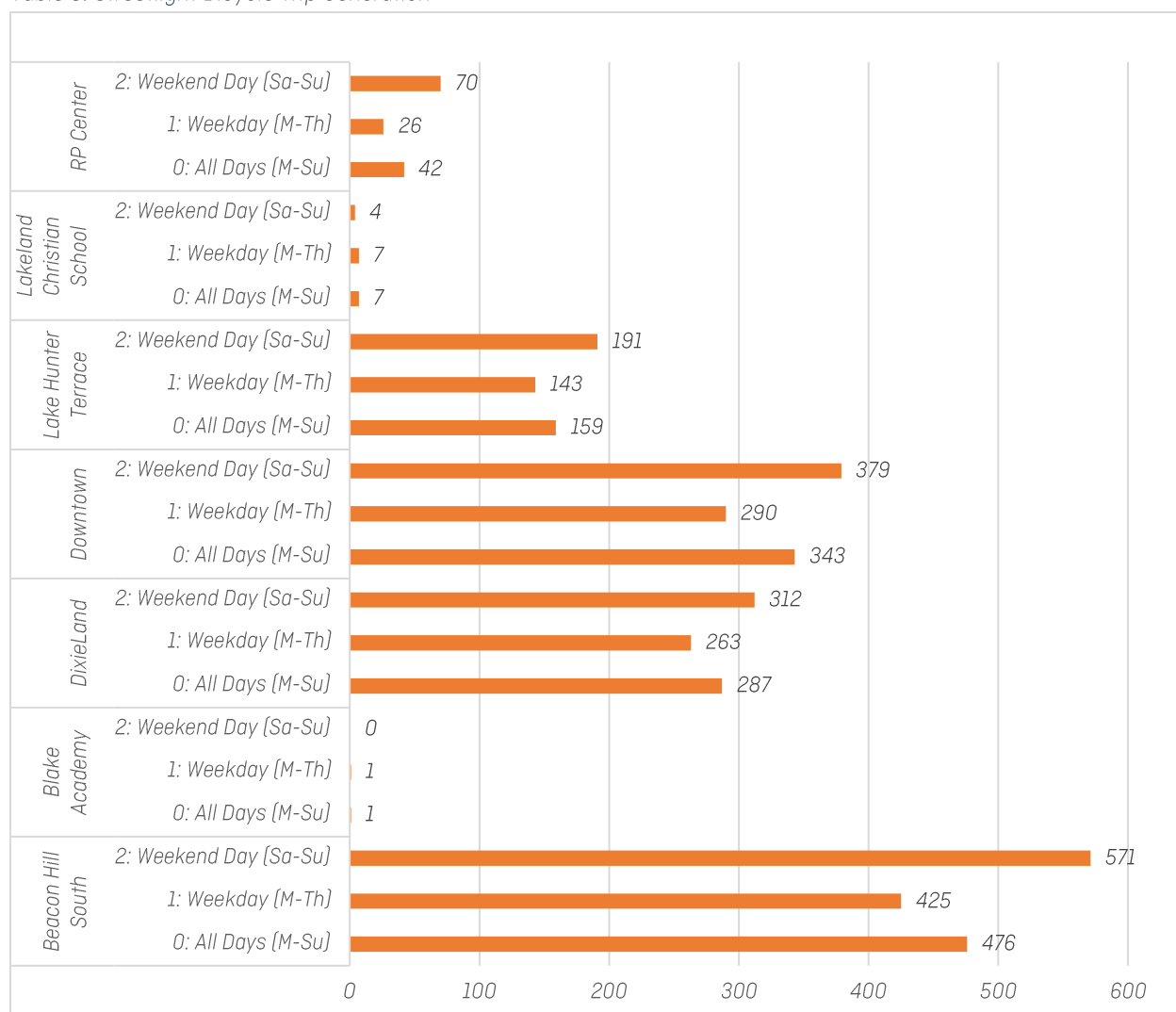
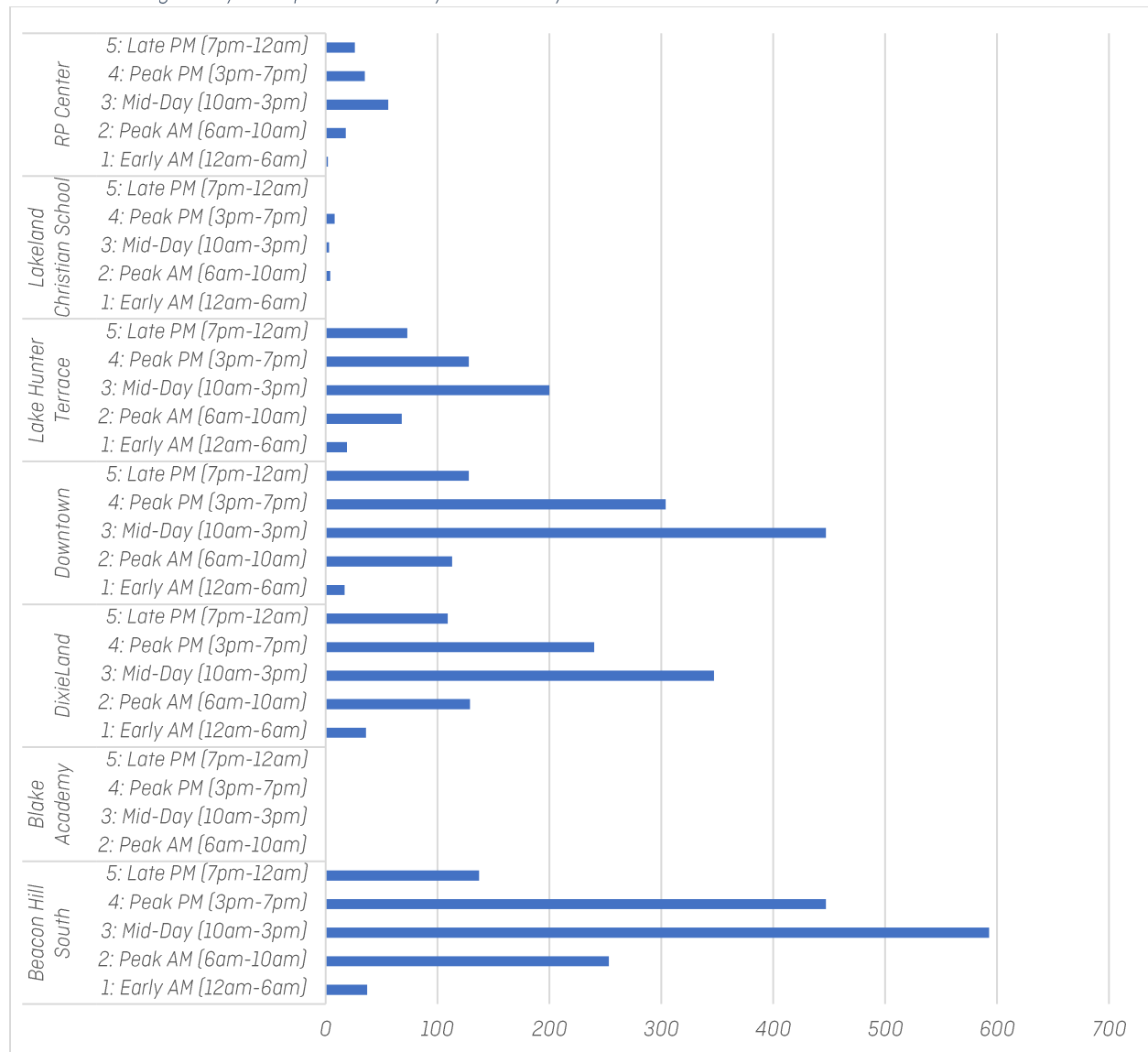


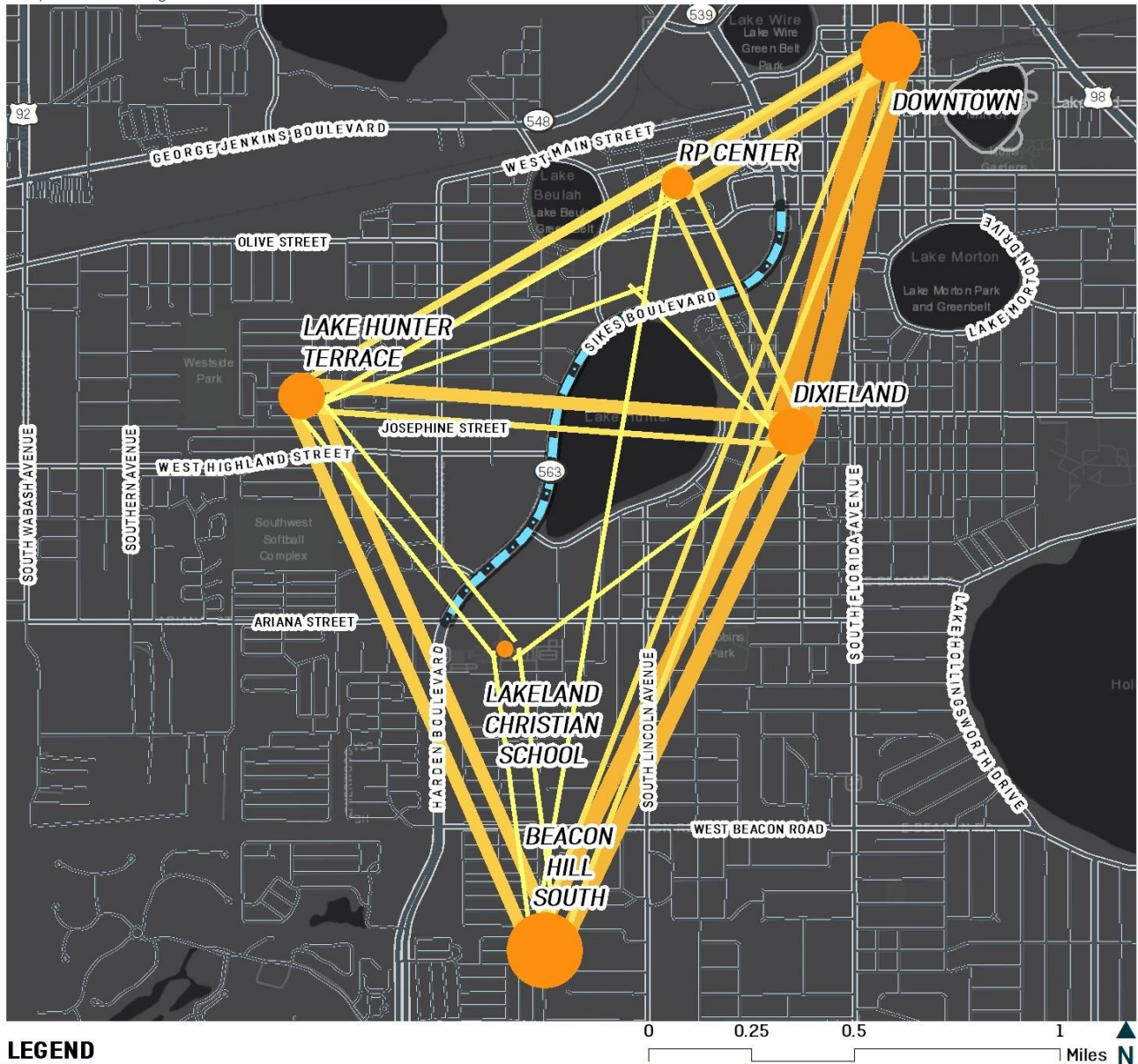
Table 7: Streetlight Bicycle Trip Generation by Time of Day



Inter- and intra-zonal origin-destination pairs show strong connections between Beacon Hill South, DixieLand, Downtown, and Lake Hunter Terrace through cycling trips. Map 20: Streetlight Intrazonal Flows shows the connections between the neighborhoods. The flows illustrate only the overall flow, not the precise path of typical cycling trips which likely use a combination of Sikes Boulevard, South Florida Avenue, and New York Avenue.

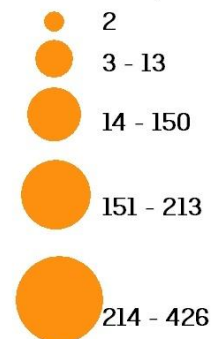
To get a better sense of existing usage along the Proposed Trail, four Streetlight “gates” measured the number of pedestrians and cyclists passing through zones along the trail. Map 21 shows the cyclist counts and the associated gates; there are very few cyclists that use Sikes Boulevard for the trip, which reflects the lack of bicycle facilities along the roadway. Map 22 reflects the same gates but instead measures pedestrian flows. Because there is existing sidewalk infrastructure along the Proposed Trail, it makes sense that pedestrian counts are much higher than cycling counts.

Map 20: Streetlight Intrazonal Flows



LEGEND

Interzonal Trip Node Trips (Cycling)

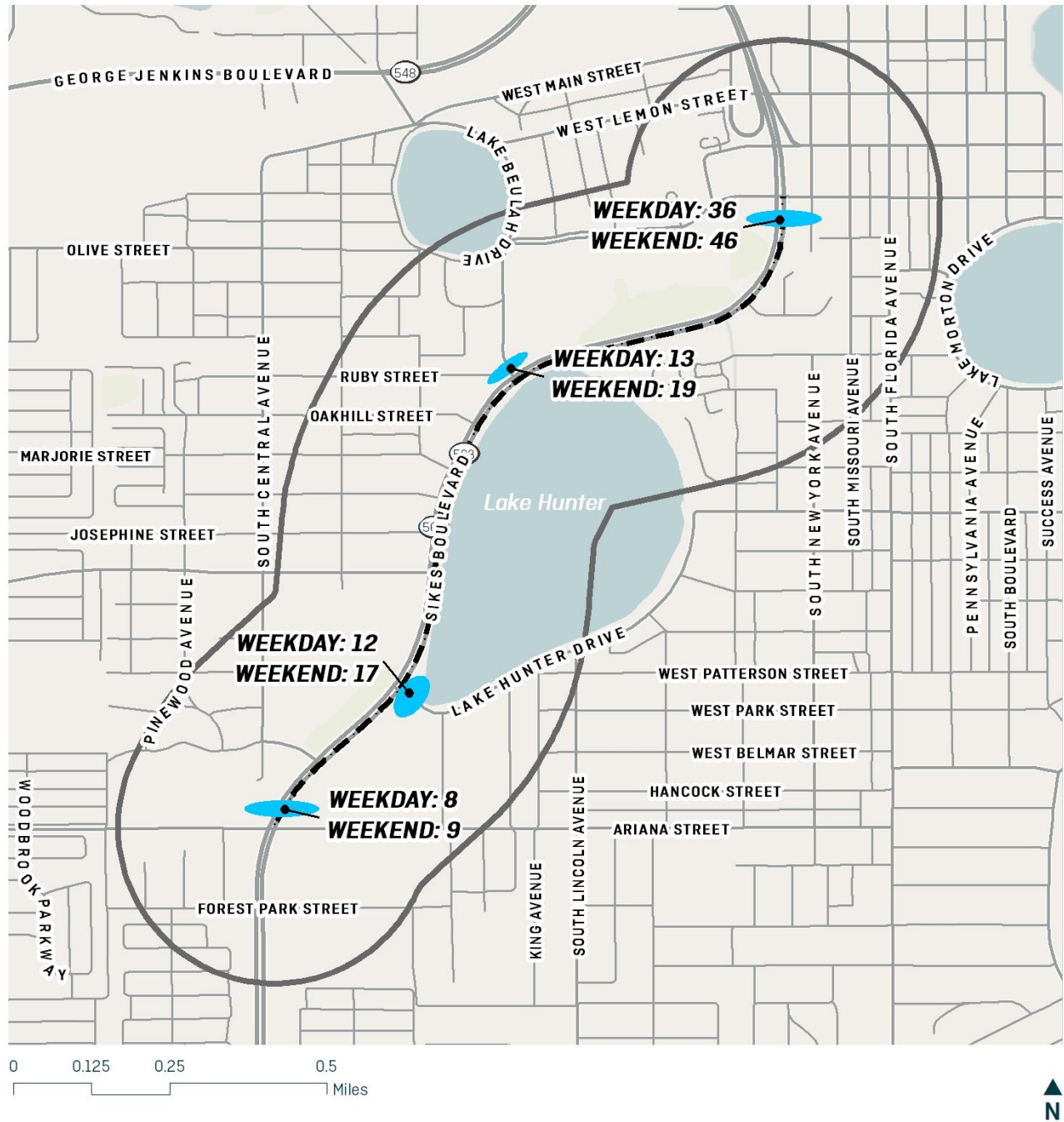


Intrazonal Index Trips (Cycling)

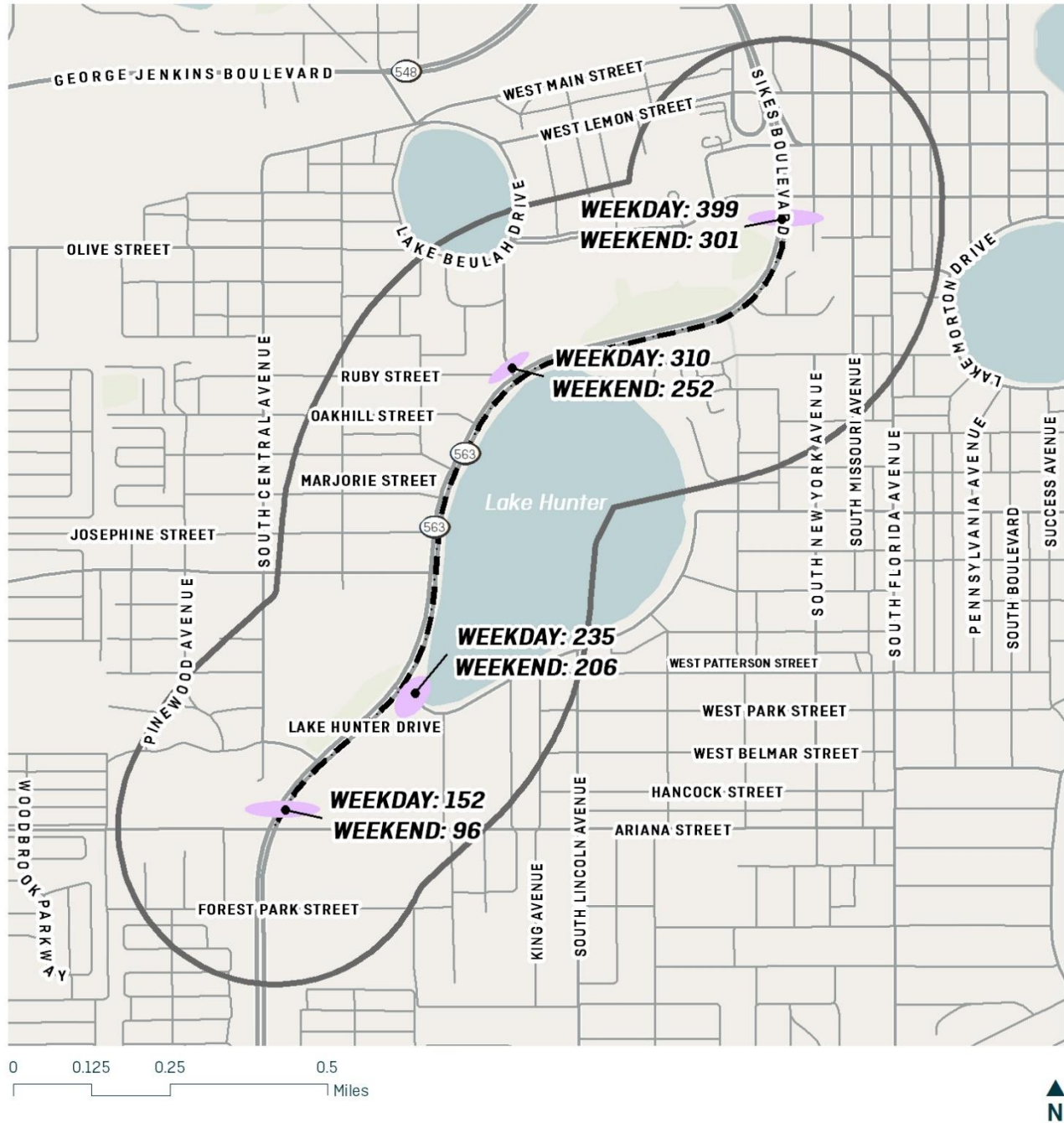


Streetlight Data (mid-2018 - mid-2020)

Map 21: Streetlight Cyclist Gates Along Proposed Trail



Map 22: Streetlight Pedestrian Gates Along Proposed Trail



Source: Streetlight Platform
Mid-2018 - Mid-2020

Cultural and Community Resources

Neighborhoods

The Proposed Trail would serve a large residential population within several downtown neighborhoods. Because the neighborhoods are historic, they tend to have a well-gridded street network conducive to walking and biking. Dixieland, Munn Park, and Lake Hunter Terrace fall within the formal Study Area; abutting those neighborhoods are East Lake Morton, South Lake Morton, and Beacon Hill. All of the historic neighborhoods are shown on Map 23.

The **Dixieland Historic District** comprises 300 acres, with some structures dating back to 1905. Dixieland is adjacent to the Study Area trail only at its northern end, but it spans most of the opposite side of Lake Hunter and is accessible via the existing eastern Lake Hunter path. Wood Frame Vernacular, Bungalow, and Neo-Classical architecture characterize most historical sites in Dixieland.

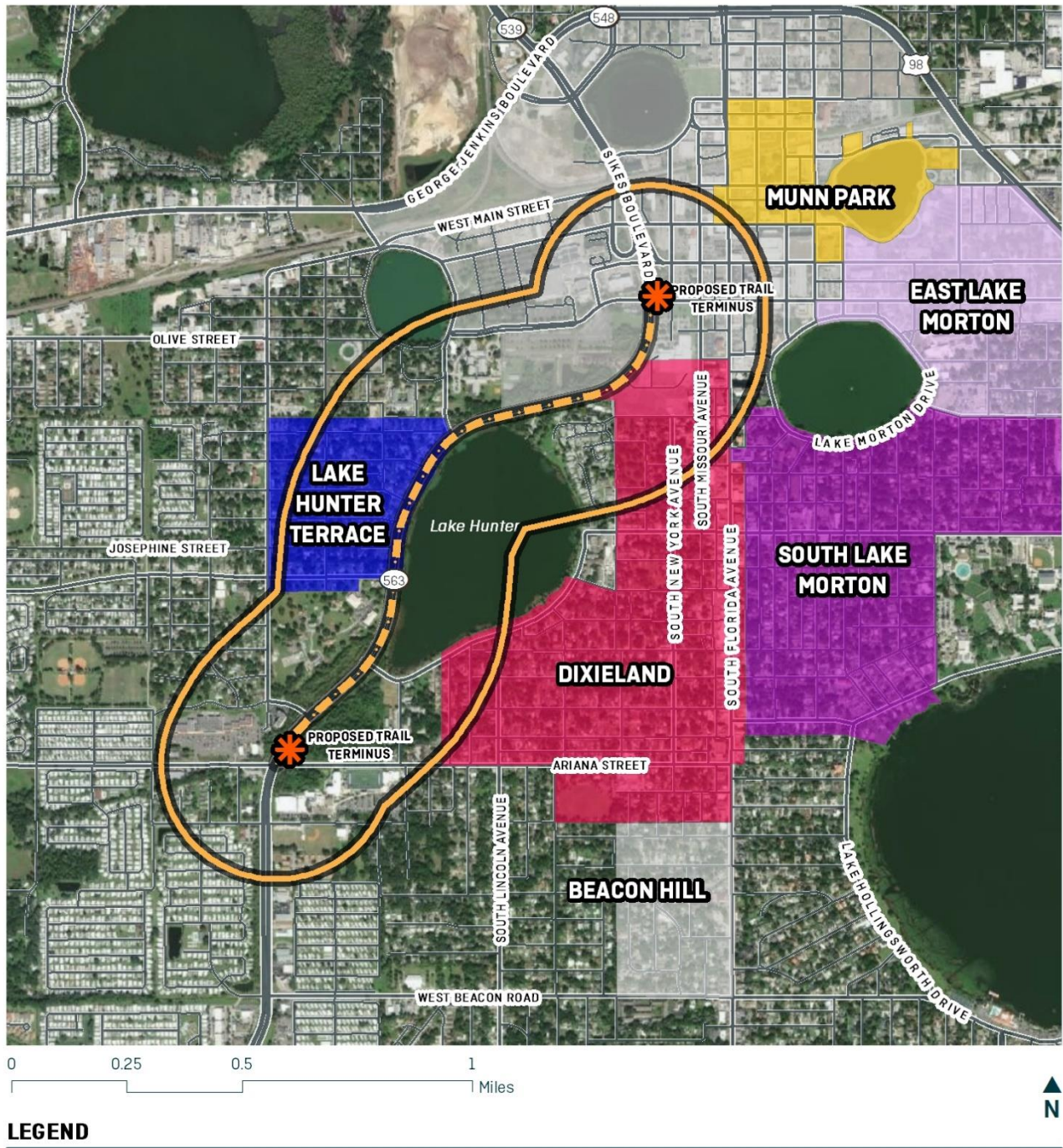
The **Lake Hunter Terrace Historic District** is a smaller neighborhood (65 acres) and has building stock dating back to 1924. As with Dixieland, Lake Hunter Terrace's historical stock includes Wood Frame Vernacular, Bungalow, and Neo-Classical architecture.

The northeast edge of the Study Area includes the historic area of **Munn Park**, which comprises the heart of Lakeland's historic downtown business district. Settled in the 19th century, there are several existing structures dating back to at least 1905. Notable buildings within the district and the Study Area include the Polk Theatre (1928) and the Oates Building (1925). The neighborhood also includes a historic Kress store building and waterfront feature. Map 24 displays the historic structures in the Study Area as recorded by the Florida Master Site File.

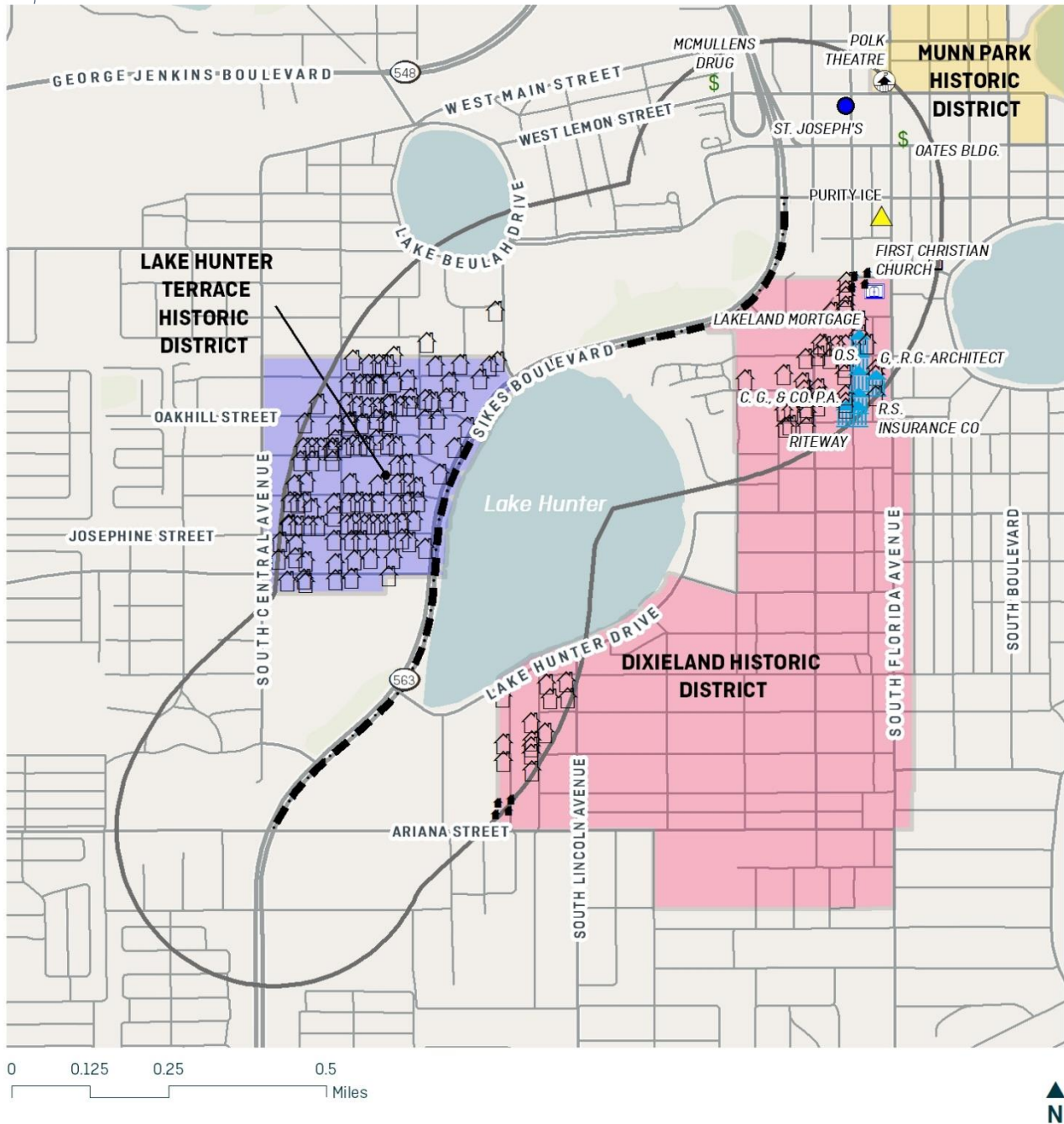
Technically designated as separate historic districts, **East Lake Morton** and **South Lake Morton** together comprise the **Lake Morton** community. Neither neighborhood directly falls within the Study Area, but they connect to Munn Park and Dixieland. Both neighborhoods are historic residential downtown communities whose historical housing stock was constructed in the mid-1920s using Mediterranean Revival and Bungalow-Craftsman styles. The Lake Morton neighborhood includes the Frank Lloyd Wright Visitor Center and the Polk Museum of Art. East Lake Morton bounds Florida Southern College's eastern perimeter.



Map 23: Historic Neighborhoods



Map 24: Historic & Cultural Sites



LEGEND

Florida Historic Site File	Industrial	Religious Temple
Apartment	Office	Proposed Trail
Commercial	Private Residence	Study Area
Entertainment	House of Worship	

Source: Florida Division of Historic Rscrs.
Florida Master Site File (2020)

Community Facilities

The Study Area is home to several social services, cultural, and community-oriented facilities that help the Lakeland area and neighborhoods surrounding the Trail. The Pace Center for Girls and the Florida Baptist Children's Homes + One More Child Center, located at the southwest end of the Proposed Trail, serve the needs of children and young adults. The Lakeland Housing Authority manages subsidized and affordable housing stock throughout the City of Lakeland and parts of Polk County; they have an administrative facility located northwest of the proposed Trail where they also perform job-training services. Two schools and several churches are located within the Study Area. Several of the key social and community-oriented facilities are shown on Map 25.

The Polk Theatre and Office Building and the Oates Building are also within the Study Area. These two buildings are focal points throughout Lakeland and Polk County for their architectural value. The Polk Theatre also possesses substantial cultural value through its programming and events.

Parks

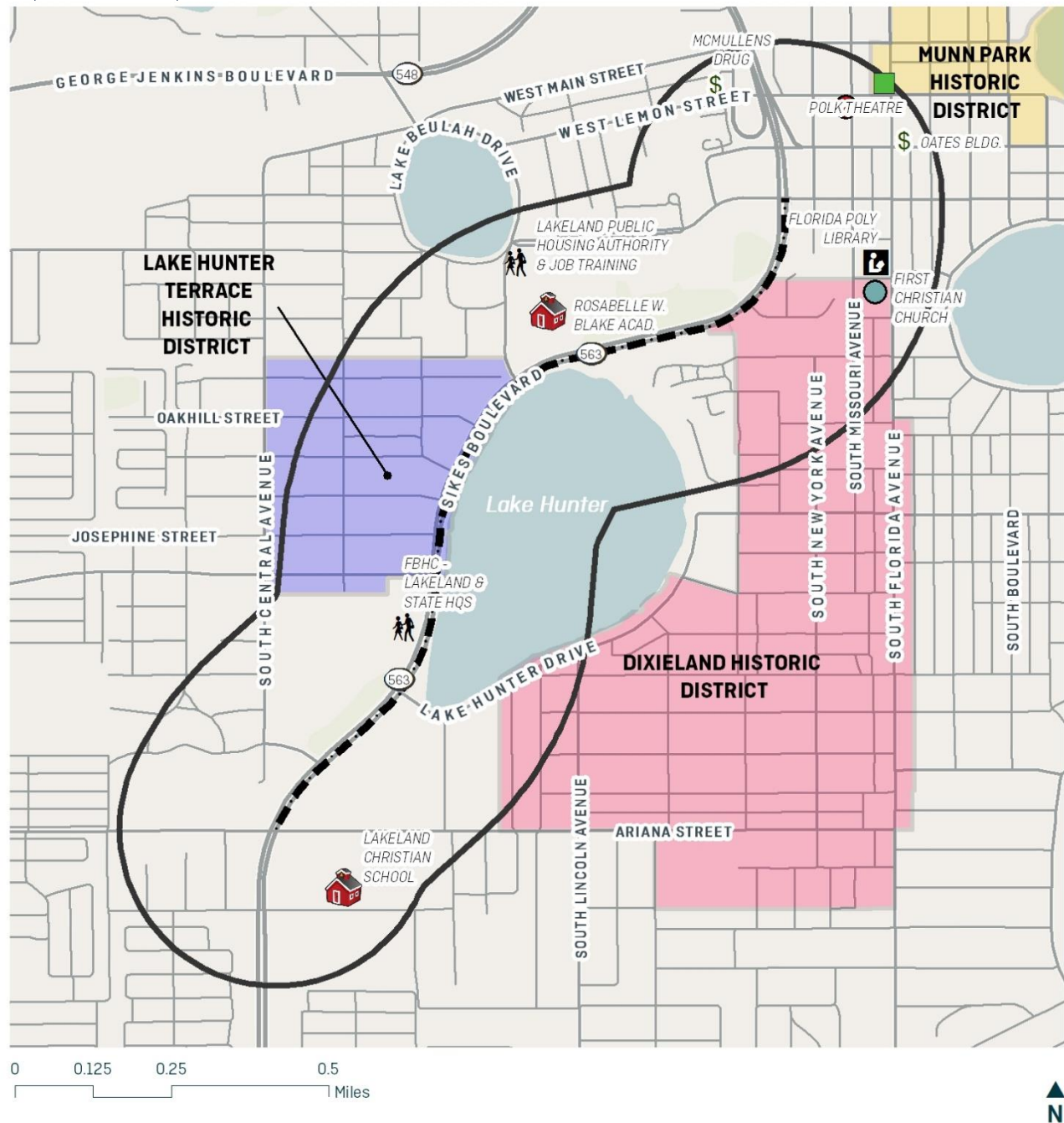
There are seven parks located in the Study Area:

- Lake Beulah Shore
- Veteran's Memorial Park
- Lake Hunter Shore
- Naylor Park
- Drane Park
- Lemon Street Promenade
- Lake Hunter Boat Ramp






There are 17.65 acres of park space throughout the formal Study Area, and the total area of those parks that connect to the Study Area is 27.13. Area parks are shown on Map 26.



Map 25: Community Facilities

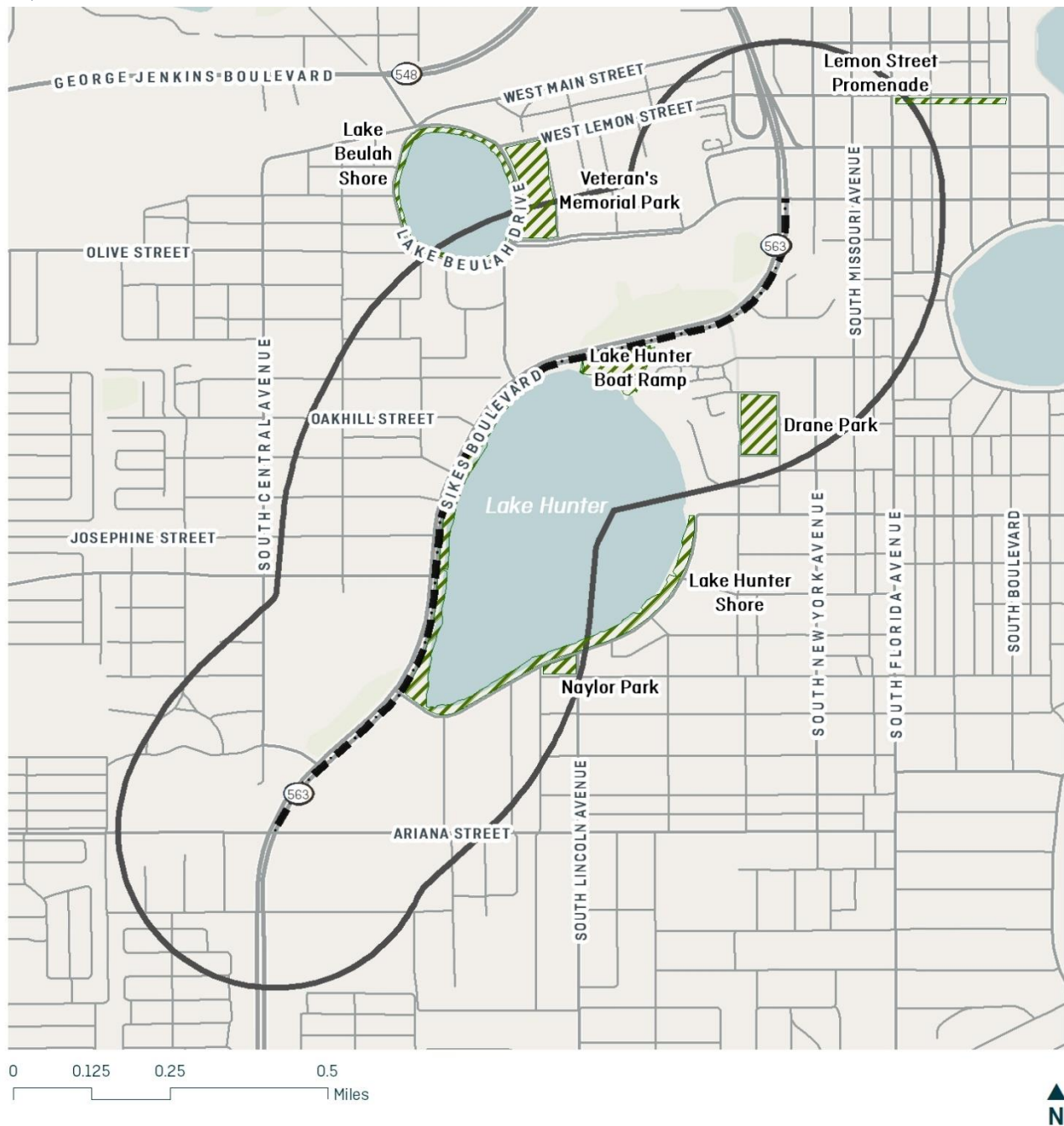


LEGEND

-  Social Services
-  Schools
-  Libraries
-  Proposed Trail
-  Study Area

Sources:
City of Lakeland OpenData - Community Services
State of Florida Master Site File - Historic Structures

Map 26: Parks



LEGEND

- Area Parks
- Proposed Trail
- Study Area

Source: Lakeland OpenGIS
Citywide Parks & Open Spaces (2020)

Environment

Most land within the Study Area is urbanized, but sensitive environmental areas are located adjacent to Lake Hunter, itself a natural freshwater lake. This section discusses soils, species, contaminants, and wetlands within the Study Area.

Wetlands

The US Fish and Wildlife Service (FWS) maintains the National Wetlands Inventory, which covers the entire United States and classifies wetland areas. Map 27 shows wetlands for the Study Area. The largest item in the wetland inventory is Lake Hunter itself, constituting 90 percent of the wetland areas in the Study Area. The remaining 10 percent of wetland-classified land belongs to the *Emergent* designator. Emergent wetlands have consistent, perennial vegetation that consume 30 percent of aerial coverage. Also within this area is the *Emergent Shrub* wetland type, which is the same as the Emergent classification with the addition of woody plants less than 20 feet tall, stunted due to environmental conditions⁹. Map 27 also displays a riverine connection at the southwest end of Lake Hunter extending past the Study Area.

A more detailed categorization of upland and wetland land-use types found within the Study Area is presented in Table 8. These undeveloped upland and wetland land use types have the potential to provide suitable habitat for protected species. A preliminary desktop review and environmental field review mapped land use, uplands, wetlands, and surface waters within the Study Area. A more detailed review following the *USFWS Classification Systems of Wetlands and Deepwater Habitats of the United States* (Cowardin, et al 1979), FLUCFCS, Chapter 62-340 Florida Administrative Code, the Corps of Engineers Wetland Delineation Manual (TR T-87-1), and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coast Plain Region (TR-10-20) will be needed to determine jurisdictional wetland boundaries. The wetlands identified in this report have not been formally approved by the SWFWMD or the U.S. Army Corps of Engineers (USACE).

⁹ "Classification of Wetlands and Deepwater Habitats of the United States." Federal Wetlands Subcommittee, 2013. See Pages 33-4.

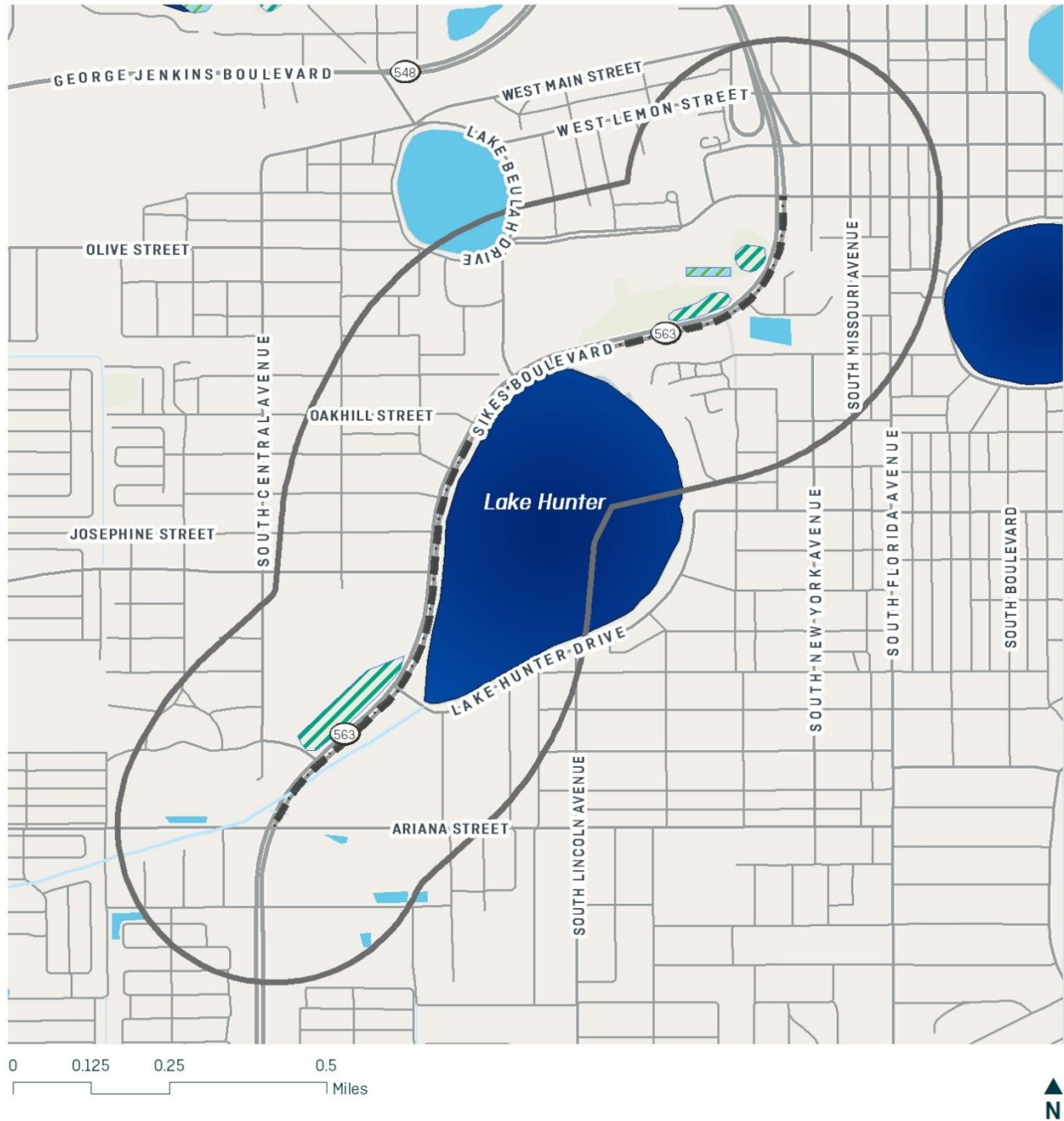


Table 8: Undeveloped Upland and Wetland Land Use Types

LAND USE	DESCRIPTION
FLUCFCS 4340 HARDWOOD - CONIFER MIXED	This land use includes forested areas in which neither conifers nor hardwoods are the dominant species. This land use type is found south of Lake Hunter, north and south of Ariana Street. These areas may provide foraging and habitat for protected species.
FLUCFCS 5100 STREAMS AND WATERWAYS	This land use includes rivers, creeks, canals, and other linear water bodies and can provide habitat as well as foraging for protected species. This land use type can be found at the outflow system south of Lake Hunter as well as several roadside drainage conveyance systems north of Lake Hunter.
FLUCFCS 5200 LAKES	This land use includes large inland water bodies as well as large reservoirs. These systems can provide habitat as well as foraging for protected species. Lake Hunter falls within this land use category.
FLUCFCS 5300 RESERVOIRS	These man-made systems are intended for water retention and flood control. These areas may contain little to no emergent aquatic vegetation and likely provide little habitat and foraging areas for wildlife. These systems can be found interspersed within the general Study Area.
FLUCFCS 6150 STREAMS AND LAKE SWAMPS (BOTTOMLAND)	These predominately hardwood systems are usually found within flood plains of rivers, creeks, or lakes and are sometimes referred to as stream hardwoods. These areas provide suitable foraging and habitat for wildlife. This wetland type is found north of Lake Hunter along the western side of Sikes Blvd. Portions of this area are considered permitted mitigation areas.
FLUCFCS 6300 WETLAND FORESTED MIXED	This land use describes mixed wetland forest communities that have a mixture of conifer and hardwood tree species where neither is predominant. These areas may provide suitable habitat, foraging, and cover for protected plant and animal species. This wetland classification can be found south of Lake Hunter. Portions of these areas are considered permitted mitigation areas.
FLUCFCS 6400 VEGETATED NON- FORESTED WETLANDS	This land use includes marshes and seasonally flooded basins and meadows. These communities are usually confined to relatively level, low-lying areas and provide habitat, foraging, and cover for protected plant and animal species. This land use can be found along the western edge of Lake Hunter.
FLUCFCS 6410 FRESHWATER MARSHES	These wetlands are vegetated non-forested systems. Dominant vegetation within these systems usually consists of sawgrass, cattail, arrowhead, buttonbush, etc. These areas can be found north and south of Lake Hunter. Portions of these areas are considered permitted mitigation areas.
FLUCFCS 6440 EMERGENT AQUATIC VEGETATION	These non-forested systems are distinguished by the presence of floating vegetation and full or partial emergent vegetation. and provide habitat, foraging, and cover for protected plant and animal species. This land use can be found along the western edge of Lake Hunter.
FLUCFCS 6530 INTERMITTENT PONDS	These man-made features are intended for water retention and flood control during rainy seasons. These areas are seasonally flooded and may provide foraging for protected species during some parts of the year. One location can be found north of Ariana Street.



Map 27: Wetlands



LEGEND

Wetland Type	
	Freshwater Emergent Wetland
	Freshwater Forested/Shrub Wetland
	Freshwater Pond
	Lake
	Riverine
	Proposed Trail
	Study Area

Source: US Fish & Wildlife
Wetlands Database (June 2020)

Soils

A review of the US Department of Agriculture (USDA) NRCS Soils Survey identified 12 different soil types within the Study Area. Per the Florida Association of Environmental Soil Scientists 2007 Hydric Soils of Florida Handbook and USDA NRCS soil survey, two soil types within the Study Area are hydric and could support anaerobic wetland conditions. Although a particular soil may be listed as hydric based on hydric soil criteria, nullifying factors include the inclusion of non-hydric soil types, drainage activities, and landscape position. Table 9 itemizes the soil types found within the Study Area, and Map 25 visualizes them in the Study Area.

Table 9: Soils

SOIL NUMBER	SOIL NAME	HYDRIC
7	Pomona fine sand	No
13	Samsula muck, frequently ponded, 0-1% slopes	Yes
16	Urban land, 0 to 2% slopes	No
17	Smyrna and Myakka fine sands	No
35	Hontoon muck, frequently ponded, 0-1% slopes	Yes
41	St. Johns sand	No
51	Pomona-Urban land complex	No
53	Myakka-Immokolee-Urban land complex	No
55	Sparr-Urban land complex, 0-5% slopes	No
59	Arents-Urban land complex, 0-5% slopes	No
61	Arents, organic substratum-Urban land complex	No
99	Water	N/a

Contamination

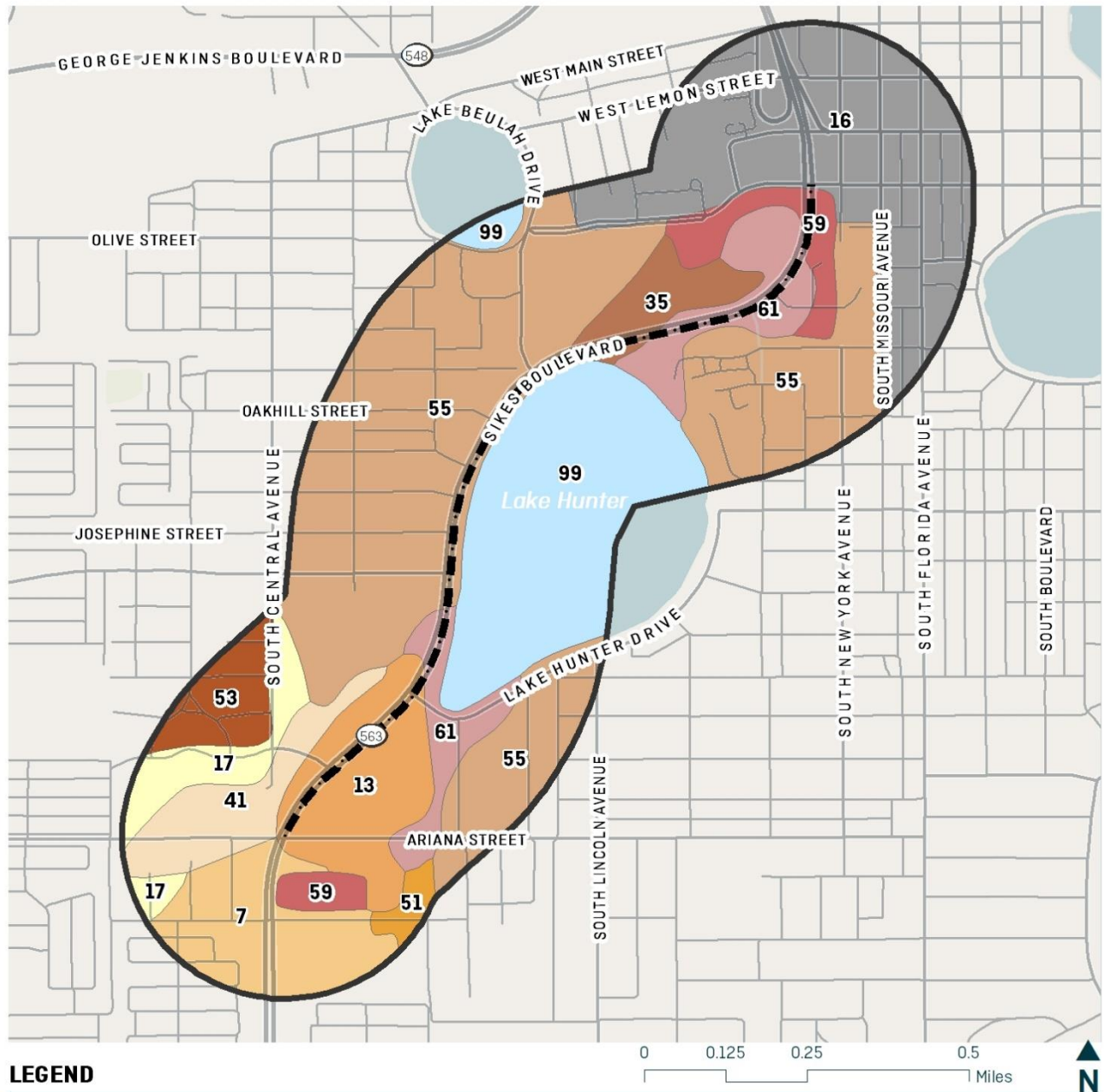
Sites with *potential* contamination locations are depicted on Map 26. While there are many data points, ***not all the points represent actual contamination***; further review of these resources may be appropriate during future phases. Numerous regulated contamination datasets were used to determine potential contamination within the study area: State Underground Petroleum Environmental Response (SUPER) Act Wells, Storage tank Contamination Monitoring sites, SUPER Act Risk Sources, US Environmental Protection Agency (USEPA) Toxic Release Inventory sites, USEPA Superfund sites, USEPA Resource Conservation and Recovery Act (RCRA) sites, Petroleum Contamination Monitoring sites, Solid Waste Facilities, Railroads, National Priority List sites, and Brownfields.

There are 15 contamination monitoring sites within the study area, according to the Florida Department of Environmental Protection (FDEP). Listed ownership names in the FDEP database appears below:

Lakeland City-Dwntrn. Dev. Au.	Barnett Bank (formerly)	H&O Food Sales Inc	Purity Ice Company (formerly)
Lakeland Ledger	Frontier FL LLC-Lakeland Main	Goodyear Tire & Rubber Co	Lake Mirror Partnership
Baptist Children's Homes	Ariana Friends Inc	Gahc4 Lake Morton GISH LLC	Lakeland Downtown Dev. Authority
Haines City Citrus Growers	Sun Trust Real Estate Corp	Joe P. Ruthven	

The West Lake Apartments were designated as a Brownfield Reuse Area by the City of Lakeland, but this site is not listed as requiring ongoing monitoring by FDEP. The land is owned by the Lakeland Public Housing Authority (see Map 7). The former Purity Ice Company monitoring location is also listed as a Petroleum clean-up site by FDEP.

Map 28: Soils



LEGEND

Study Area

Proposed Trail

Soil Type

7: Pomona fine sand

13: Samsula muck, frequently ponded, 0-1% slope, hydric

16: Urban land, 0-2% slope

17: Smyrna and Myakka fine sands

35: Hontoon muck, frequently ponded, 0-1% slope, hydric

41: St Johns sand

51: Pomona-Urban land complex

53: Myakka-Immokolee-Urban land complex

55: Sparr-Urban land complex, 0-5% slope

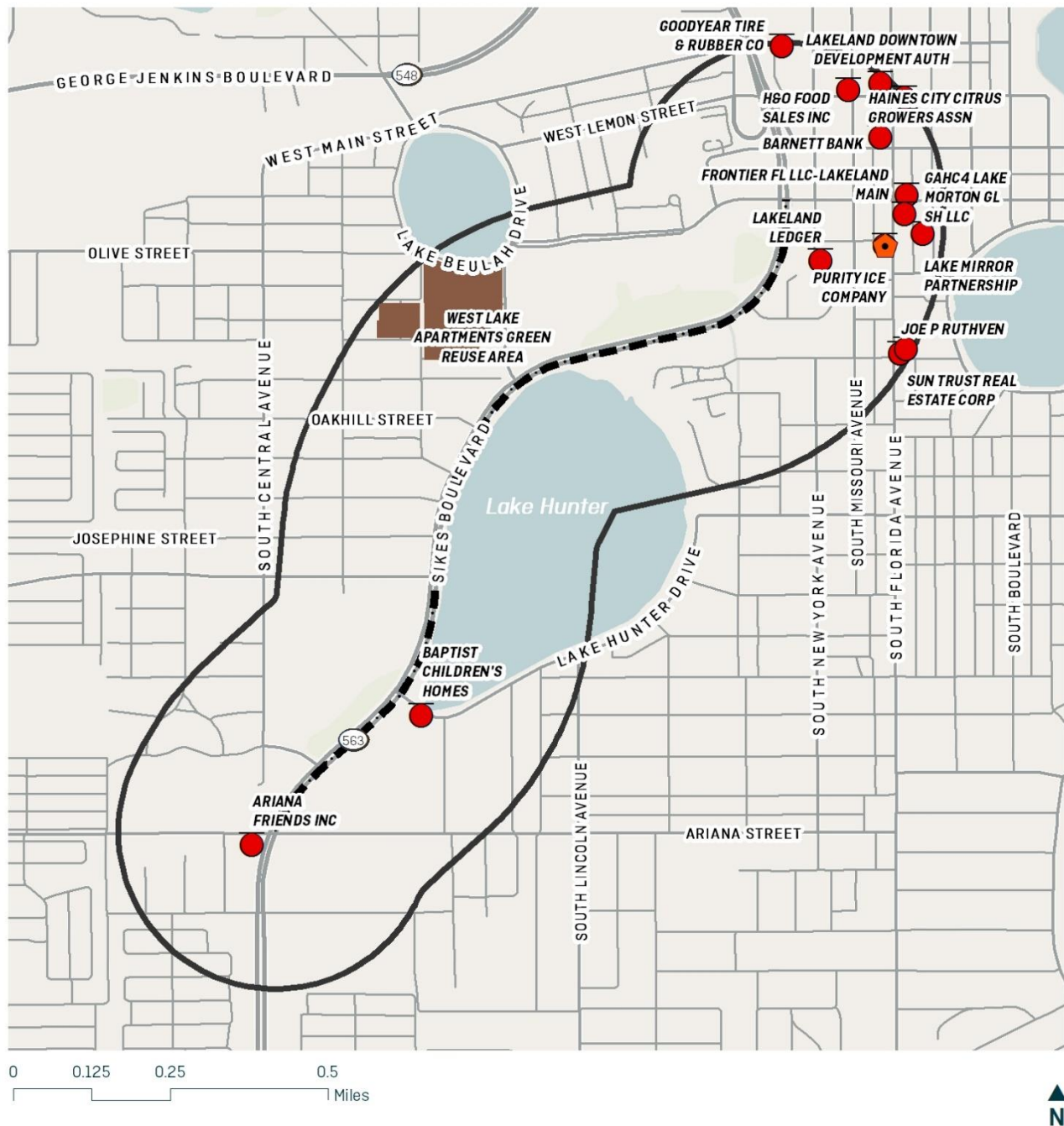
59: Arents-Urban land complex, 0-5% slope

61: Arents, organic substratum-Urban land complex

99: Water

Source: USDA NRCS

Map 29: Sites with Environmental Monitoring, Brownfields



LEGEND

- Cleanup Sites
- Brownfield Areas
- Storage Tank Contamination Monitoring
- Study Area
- Proposed Trail

Sources: USEPA (SUPER Fund Sites, Toxic Release Inventory, Storage Tank, Resource Conservation, and RCRA), Petroleum Contamination sites, Solid Waste Sites, National Priority Sites, and Brownfield Sites. Labeled names reflect site ownership name in respective database.

Protected Species

A desktop environmental analysis and general field review were conducted for the study area for the presence of federal and/or state-protected species and their suitable habitat following 50 Code of Federal Regulation (CFR) Part 402 of the Endangered Species Act of 1973, as amended, Chapters 5B-40: Preservation of Native Flora of Florida and 68A-27 Florida Administrative Code Rules Relating to Endangered or Threatened Species and Part 2, Chapter 16 – Protected Species and Habitat of the FDOT PD&E Manual. Literature reviews and agency database searches were conducted to document state and federally protected species presence, their habitat, and critical habitat occurring or potentially occurring within the study area.

Nine federally protected species, six state-protected species, and two protected, non-listed species were determined to be present or have a likelihood for utilization of habitats within or adjacent to the proposed Trail. They are listed in Table 10. The study area was determined to be within the core foraging area (CFA) for three wood stork nesting colonies [Map 30].

A list of potentially occurring protected species was developed and each species was assigned a *low*, *moderate*, or *high* likelihood for occurrence within habitats found within the Study Area.

- **Low** - Species with a low likelihood of occurrence are defined as those species that are known to occur in Polk County, but the preferred habitat is limited within the study area, or the species is rare, or no longer extant.
- **Moderate** - Species with a moderate likelihood for occurrence are those species known to occur in Polk, and for which suitable habitat is located within the study area, but no observations or positive indications exist to verify the species presence.
- **High** - Species with a high likelihood for occurrence are suspected within the study Area based on known ranges and existence of sufficient preferred habitat; are known to occur beyond the study area, or have been previously observed or documented in the project vicinity.

For species to be considered potentially present within the study area, the project area must be within the species' range and must contain suitable habitat for the species. Table 10 lists the protected species with the potential to occur within the study area, based on the potential availability of suitable habitat and known ranges.

During the field review, researchers observed: Great Blue Heron, Anhinga, Osprey, American alligator, American coot, Little blue heron, Tri-colored heron, Great egret, White Ibis, Snowy egret, and the Black-bellied whistling duck.

Critical Habitat

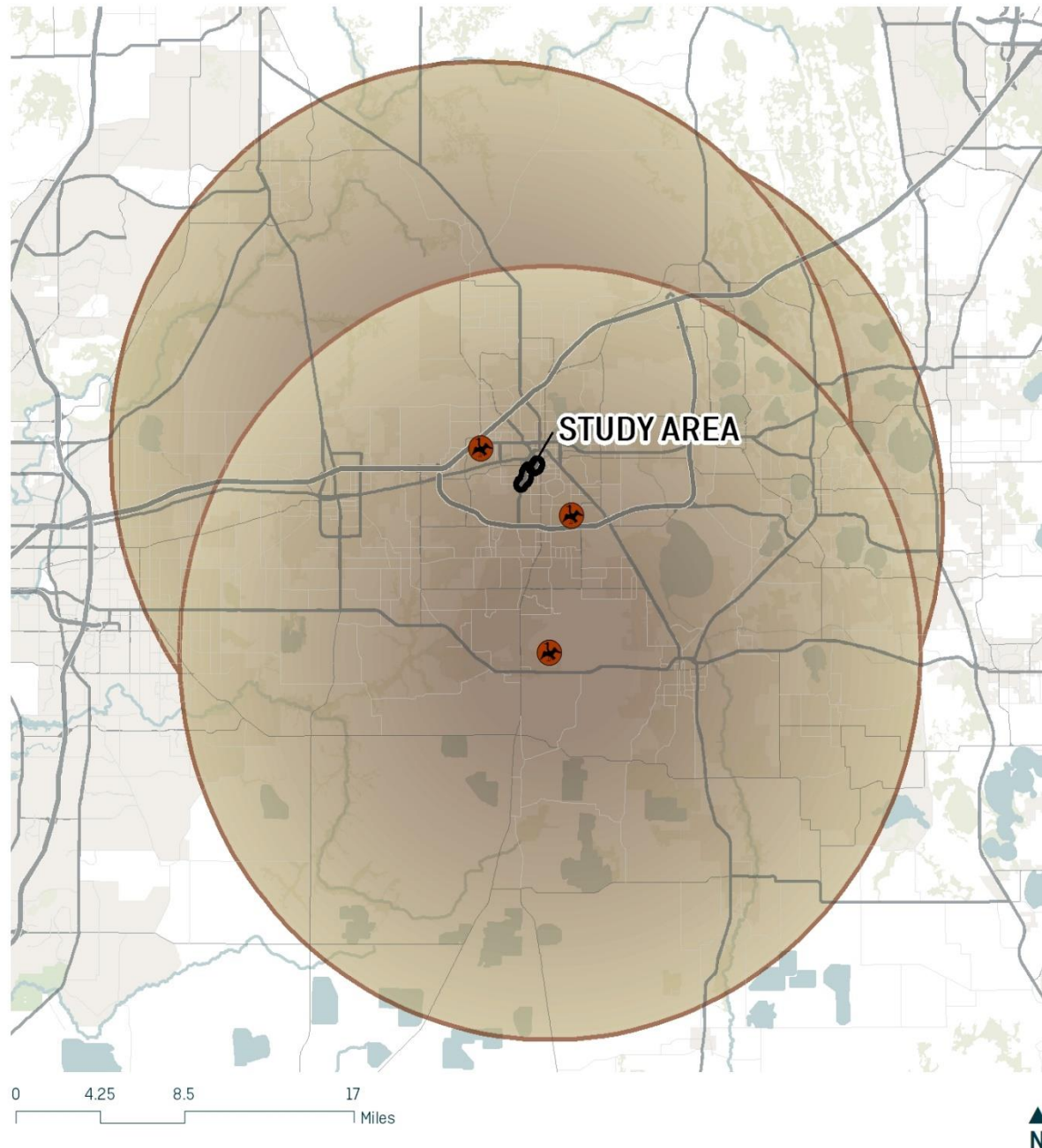
The study area was evaluated for the potential occurrence of Critical Habitat as defined by 17 CFR 35.1532. The USFWS is the authority as a federal agency to protect critical habitat from destruction or adverse modification of the biological or physical constituent elements essential to the conservation of the listed species. No Critical Habitat is present within the study area.

Essential Fish Habitat




No Essential Fish Habitat (EFH) is located within the study area, based on data from the National Marine Fisheries Service.



Map 30: Wood Stork Colonies & Core Foraging Areas



LEGEND

-  Study Area
-  Wood Stork Colony
-  Wood Stork Core Foraging Area (CFA)

Source: US Fish and Wildlife Service

Table 10: Species Potentially Within Study Area

CATEGORY	COMMON NAME	SCIENTIFIC NAME	FEDERAL LISTING ¹	STATE LISTING ²	HABITAT PREFERENCE	LIKELIHOOD OF OCCUR.
Reptiles	Blue-tailed mole skink	<i>Plestiodon egregius lividus</i>	T	FT	Florida's central ridge at elevations at 82 feet or above sea level. Found in pine and oak scrub, scrubby flatwoods, and turkey oak ridges with well or moderately drained soils.	Low
	Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	FT	Range of habitats from scrub and sandhill to mesic flatwoods. Gopher tortoise commensal species, often wintering in gopher tortoise burrows.	Moderate
	Gopher tortoise	<i>Gopherus polyphemus</i>	C	ST	Typically found in dry upland habitats, including sandhills, scrub, xeric oak hammock, and dry pine flatwoods. Commonly uses disturbed habitats such as pastures, old fields, and road shoulders.	Moderate
	Sand skink	<i>Plestiodon reynoldsi</i>	T	FT	Florida's central ridge at elevations at 82 feet or above sea level. Found in pine and oak scrub, scrubby flatwoods, and turkey oak ridges with well or moderately drained soils.	Low
	American Alligator	<i>Alligator mississippiensis</i>	T(S/A)	FT(S/A)	Freshwater lakes and slow-moving rivers and their associated wetlands. Brackish water habitats. Rarely in saltwater.	High
Birds	Audubon's crested caracara	<i>Caracara cheriway audubonii</i>	T	FT	Found in open grasslands with a low density of herbaceous groundcover and sparse cabbage palms.	Low
	Bald eagle	<i>Haliaeetus leucocephalus</i>	NL	NL	Commonly coastal areas, bays, rivers, lakes, or other food sources. Forages near water. Nests in tall trees.	Moderate
	Everglades snail kite	<i>Rostrhamus sociabilis plumbeus</i>	E	FE	Found inland on freshwater marshes and on the edge of shallow lakes with a low vegetation profile containing apple snails.	Low
	Florida burrowing owl	<i>Althene cunicularia floridana</i>	NL	ST	Open prairies with short grasses or bare ground. Can occupy burrows dug by other ground-dwelling species or excavate their own.	Low
	Florida grasshopper sparrow	<i>Ammodramus savannarum floridanaus</i>	E	FE	Large areas of dry prairie dominated with bunch grasses and open patches maintained by frequent burns.	Low
	Florida scrub-jay	<i>Aphelocoma coerulescens</i>	T	FT	Restricted to Florida scrub dominated by scrub oaks rarely exceeding 7 feet and saw palmetto.	Low
	Little blue heron	<i>Egretta caerulea</i>	NL	ST	Freshwater, brackish, and saltwater habitats. Forages in freshwater lakes, marshes, swamps, and streams.	High
	Reddish egret	<i>Egretta rufescens</i>	NL	ST	Coastal tidal flats, salt marshes, shores, and lagoons.	Moderate
	Roseate Spoonbill	<i>Platalea ajaja</i>	NL	ST	Nests on coastal mangrove islands or in Brazilian pepper on man-made dredge spoil. Occasionally nests in willow heads at freshwater sites. Forages in shallow water of variable salinity, including marine tidal flats and ponds, coastal marshes, mangrove-dominated inlets and pools, and freshwater sloughs and marshes.	High
	Tricolored heron	<i>Egretta tricolor</i>	NL	ST	Mangroves, freshwater marshes, swamps, springs and spring runs, swales, and pond and river margins.	High
	Wood stork	<i>Mycteria americana</i>	T	FT	Marshes, floodplain lakes, swamps.	High
	Florida black bear	<i>Ursus americanus floridanus</i>	NL	NL	Mixed hardwood pine, cabbage palm hammock, upland oak scrub, and forested wetlands, such as cypress and riverine.	Low

¹ NL - Not listed; C - Candidate for listing; T - Threatened; T(S/A) - Threatened due to similarity of appearance; E - Endangered

² NL - Not listed; SSC - Species of Special Concern; ST - State Threatened; SE - State Endangered

Drainage

Stormwater Management Facilities

The study area falls within the Lake Hunter Outlet drainage basin (WBID 1543A), which includes the Lake Hunter basin (WBID 1543) with indirect outfall into the Hillsborough River. The drainage basin is displayed on Map 31.

The current storm drain system consists of both open and closed stormwater facilities along the route of the study area. Sikes Boulevard uses a series of curb inlets, manholes, and storm drain pipes to collect stormwater runoff from the existing impervious area. Runoff collected within these pipes is conveyed to Mitered End Section (MES) structures that outfall directly into Lake Hunter. There is an existing stormwater retention pond west of the Lake Hunter Boat Ramp driveway under permit 4814.000. North of Lake Hunter, between Lime Street and the Lake Hunter Boat Ramp, stormwater runoff is collected by existing roadside ditches on the east side of Sikes Boulevard.

A previously permitted sidewalk project (Permit No. 13139.000, Figure 16) intersects the proposed Trail study limits north of the Lake Hunter Boat Ramp. This sidewalk crosses the existing stormwater ditch and utilizes two elliptical 29" X 45" reinforced concrete pipes (RCP) side drains to continuously convey runoff within the ditch.

Lateral ditches with steep side slopes collect runoff from SR 563 adjacent to the existing 5-foot sidewalk. Typical sections from the permitting of Sikes Boulevard show ditch back slope at 1:2 maximum tying directly into the edge of the sidewalk at an offset of 11' from the back of curb.

*Figure 11. Elliptical Side Drain
Permit No. 13139.000 (August 2020)*



*Figure 12. Ditch Conveyance Along SR-563
Just South of Lime Street (August 2020)*



There are approximately 16 MES structures of various sizes within the study limits as well as an existing double box culvert at the intersection of Ariana Blvd and Sikes Boulevard. A field review performed by drainage engineer Kelly Thomas on August 31st, 2020 showed that the existing MES structures that outfall into Lake Hunter are in poor condition. Inverts of these outfalls were as close as 10' from the edge of the sidewalk in various locations. Figure 13 represents the average physical standing of these structures.

Figure 13: Eroded MES with Outfall to Lake Hunter (August 2020)



Floodplains

According to the Federal Emergency Management Agency (FEMA), there are three (3) Flood Insurance Rate Maps (FIRM) within the study limits. The panel numbers associated with these maps are 12105C0311G, 12105C0313G, and 12105C0315G (effective December 2016). The FEMA FIRMs indicate existing flood zones A and AE within the Study Area, as well as a Lake Hunter Drain regulatory floodway south of the lake. The flood zones generally follow the boundaries of Lakes Hunter and Beulah, and the riverine floodway emanating from Lake Hunter, see Map 23.

Figure 14. Weir Control Structure for Overflow into Regulatory Floodway

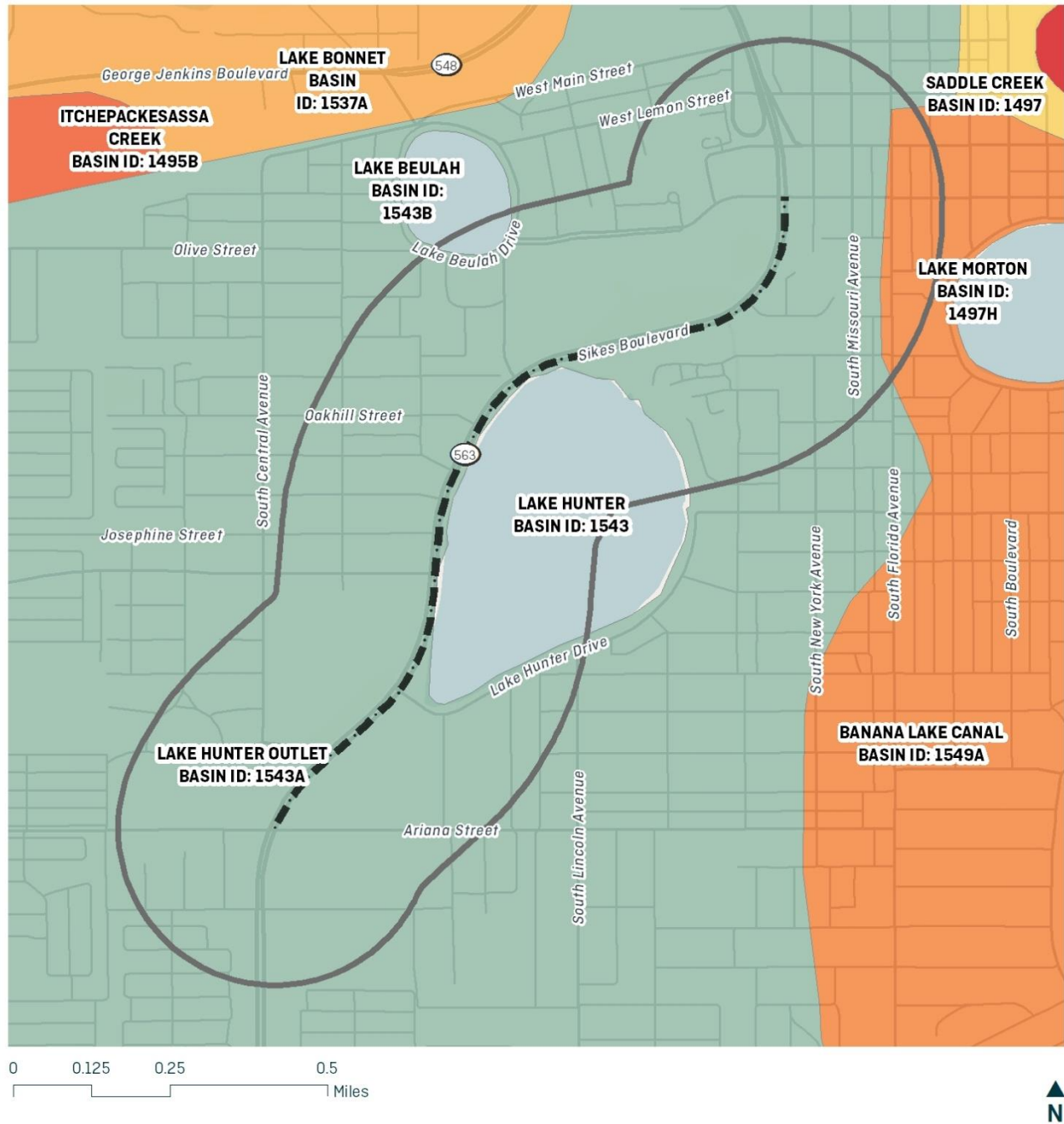


Zone A, Zone AE, and Regulatory Floodways are considered 100-year floodplains. A Flood Insurance Study (FIS) was performed for this area in September 2012 to investigate the existence and severity of flood hazards within the watershed to later be used to update the FEMA FIRMs within the area. During the final design for the proposed Trail, any fill within existing floodplains will require floodplain compensation. Should the project require fill within the regulatory floodway, a FEMA No-Rise Certification will be required to demonstrate no increase in the 100-year flood elevation as a result of the proposed fill.

A previously-permitted control structure (Permit No. 40515.000) at the south end of Lake Hunter connects two 30" X 44" RCP's to the existing floodway south of Lake Hunter Drive.

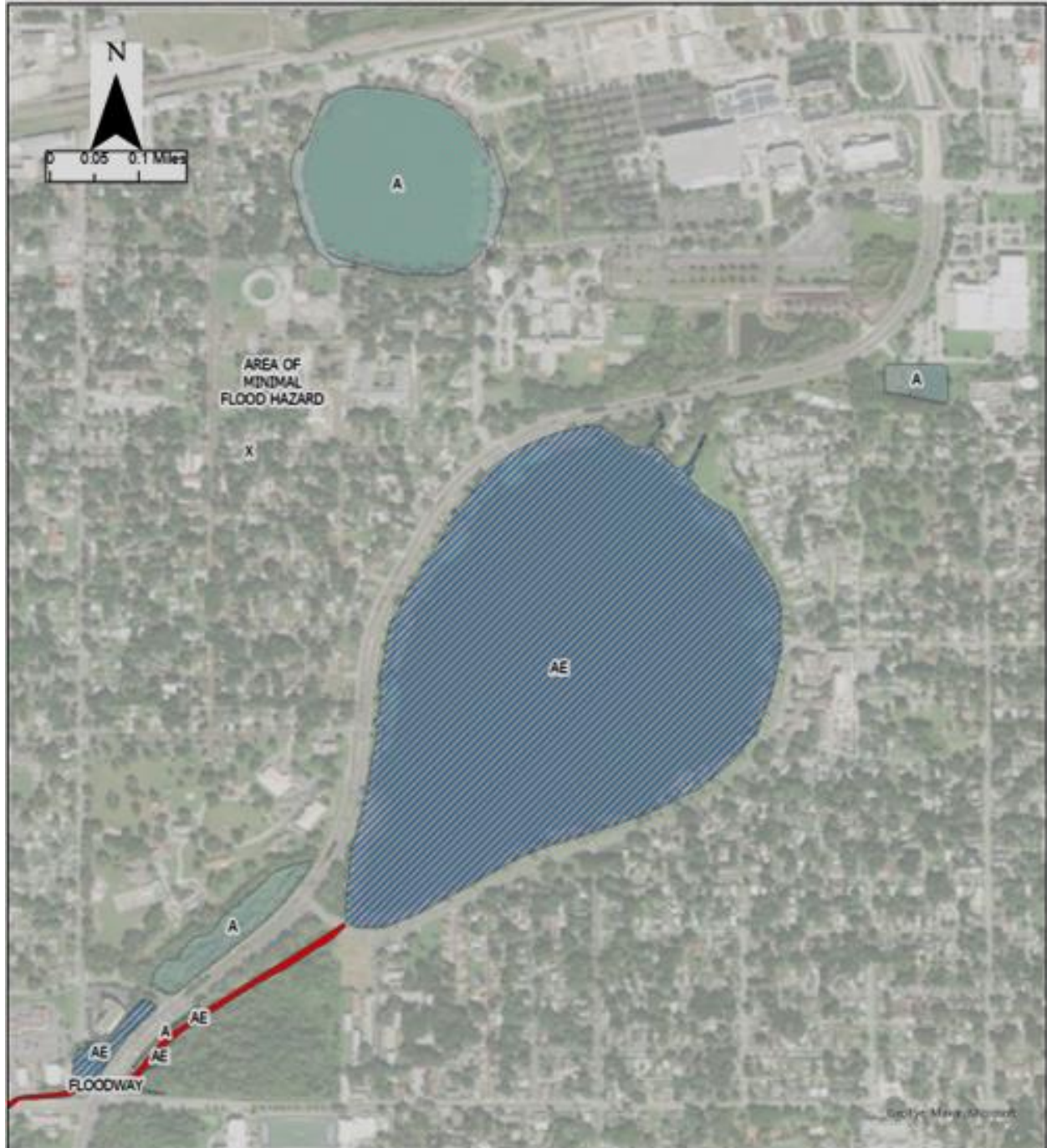
FIRMs appear in Appendix B.

Map 31: Drainage Basins



Source: Florida Department of Environmental Protection

Map 32: Flood Zones, Zoomed



Permits

According to the Southwest Florida Water Management District online permitting portal, Sikes Boulevard was previously permitted under the permit number 4814.000 and 4814.001. Along with this, there is an intersecting permitted sidewalk (Permit No. 13139.000) and an outstanding permit for the Lake hunter control structure (Permit No. 40515.000).

In general, trail projects are exempt from permitting pursuant to Rule 62.330.051(10) of the Florida Administrative Code, as long as:

- They are not located in, on, or over wetlands or other surface waters
- Have a width of eight feet or less for pedestrian paths, and 14 feet or less for multi-use recreational paths
- Are not intended for use by motorized vehicles powered by internal combustion engines or electric-powered roadway vehicles, except when needed for maintenance or emergency purposes

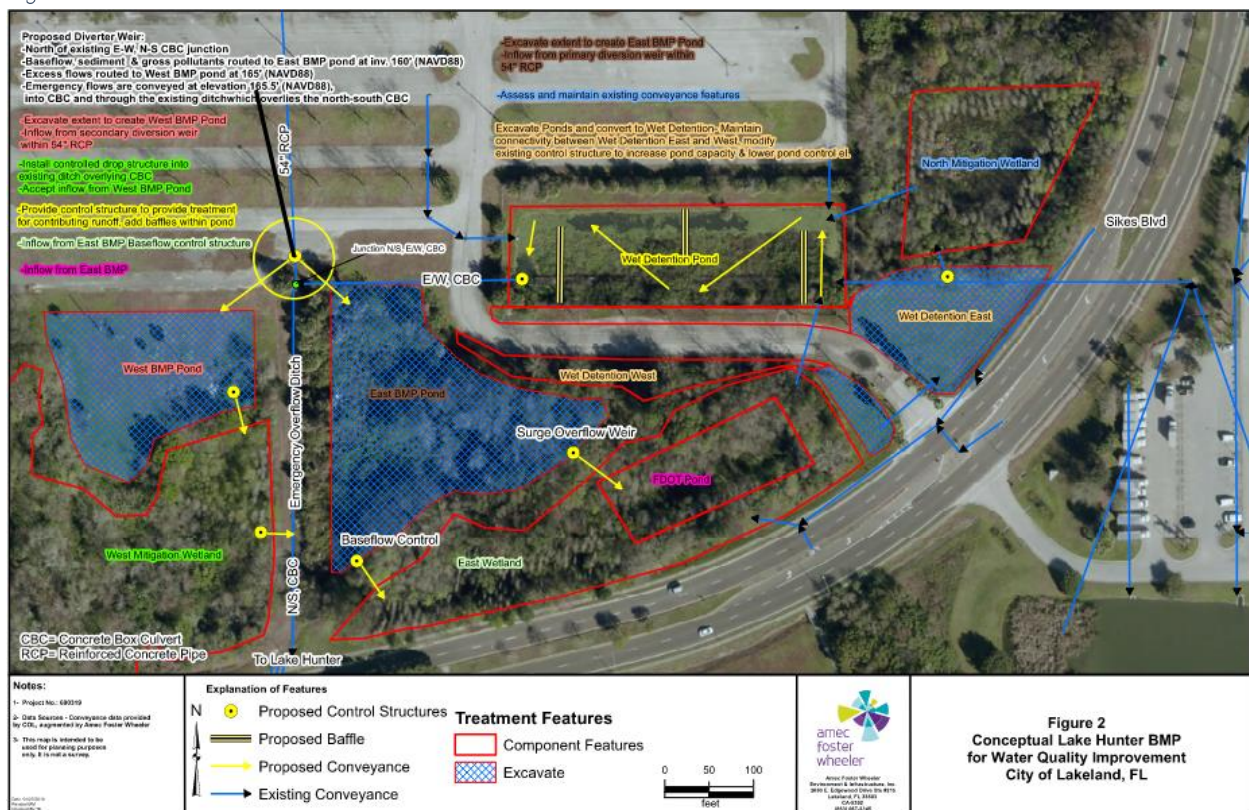
If a trail project would not qualify for an exemption due to wetland or other surface water impacts, an Individual Permit would be required. The trail impervious area would be still exempt from the treatment and attenuation requirements; however, floodplain, conveyance, and wetland impacts would need to be addressed. If a trail project impacts a previously permitted stormwater management system, a separate modification of the associated permit would be required.

Water Quality

According to the FDEP Comprehensive Verified List, the Lake Hunter Outlet Basin is verified impaired for Fecal Coliform and has been added to the 303d List (August 2020). No nutrient impairments are listed for the waterbodies included within this project; therefore, standard SWFWMD ERP regulations apply. A Best Management Practices (BMP) Stormwater Treatment Project is ongoing adjacent to the proposed study limits (Figure 15). The goal of this BMP is to reduce nutrient levels within the lake through pretreatment of stormwater runoff within detention areas.



Figure 15: Lake Hunter BMP



Infrastructure

Existing Structures

Researchers documented and assessed structures within the study area through a review of available existing plans, desktop analysis, and a site visit conducted on August 31, 2020, from approximately 9:00 am to 11:00 AM. The sky was overcast, but it was not raining at the time of the site visit. Select sheets from the existing plans for State Project Number 16003-3512 Lakeland North-South Route Phase II, SR 563 (Polk County), which are dated 1989, were obtained from FDOT District 1 and provide some information on an existing drainage structure. Additional information has been gathered through a desktop analysis. All dimensions contained herein are approximate.

There are no existing bridge structures within the project limits; however, there are five types of miscellaneous structures along the project corridor. There is one reinforced concrete box culvert, a total of 20 concrete strain poles for traffic signals at five intersections, a total of four mast arms for traffic signals at one intersection, and numerous ground signs and light poles. Each structure type is documented herein for reference and will be evaluated for potential impacts from each of the proposed Trail alternatives in a subsequent report.

Concrete Box Culvert North of the Intersection of Sikes Boulevard (SR 563) and Ariana Street

There is a concrete box culvert near the intersection of Sikes Boulevard and Ariana Street, shown in Figure 16. Based on existing plans, the culvert runs in an east-west direction and crosses under Sikes Boulevard approximately 130' north of the intersection with Ariana Street.

This structure is a two-cell 6' x 4' reinforced concrete box culvert measuring 132' in length from headwall to headwall. Based on existing plans and field measurement, the opening has a total span of 12'-8" with an interior wall thickness of 8" and an exterior wall thickness of 10". The east headwall of the culvert measures 18" from the top of the opening to the top of the headwall. The southeast wingwall is 9'-0" long and 8" thick, while the northeast wingwall is 12' - 8" long and 8" thick. There is a 36"-diameter concrete pipe that drains into the southern cell approximately 6' from the east end of the culvert. At the time of the site visit, there was approximately 2" of water and 1" to 2" of sediment in the culvert. The 2H:1V slopes from the ditch bottom to the top of the bank are protected by sand-cement rip rap that appears fully intact. Based on a limited visual inspection, there are no obvious signs of cracking, efflorescence, or significant structural issues. Maintenance records, if any exist, have been requested from FDOT.

The east end of the culvert, which empties into a large open drainage ditch, is in the vicinity of the proposed Trail. Based on field measurements at the east end of the culvert, the distance between the back of the curb and the start of the southeast wingwall is approximately 20' - 2", and the distance between the back of the curb and end of the northeast wingwall is 16' and 2". It may be possible to accommodate a trail in the available space between the roadway and the culvert opening.



Figure 16: Concrete Box Culvert
North Of The Sikes Blvd. And Ariana St. Intersection (August 2020)



Left image: east end and wingwalls of the concrete box culvert north of the Sikes Blvd. and Ariana St. intersection. Right image: sand-cement rip rap protecting slopes adjacent to the east end of the concrete box culvert.

Concrete Strain Poles at the Intersection of Sikes Boulevard (SR 563) and Ariana Street

There is a signalized intersection at Sikes Boulevard and Ariana Street with concrete strain poles at all four corners creating a box span (Figure 17). Based on a limited visual inspection, each of the poles appear to be in good condition. See the aerial image below for the strain pole locations and span lengths at the intersection. Based on desktop analysis, there is approximately 4' - 6" of clear space between Pole 1 and the back of the curb. Only Pole 1 will be evaluated for potential impacts from the proposed Trail alternatives.

Figure 17: Strain Pole Representation at Sikes Blvd & Ariana St

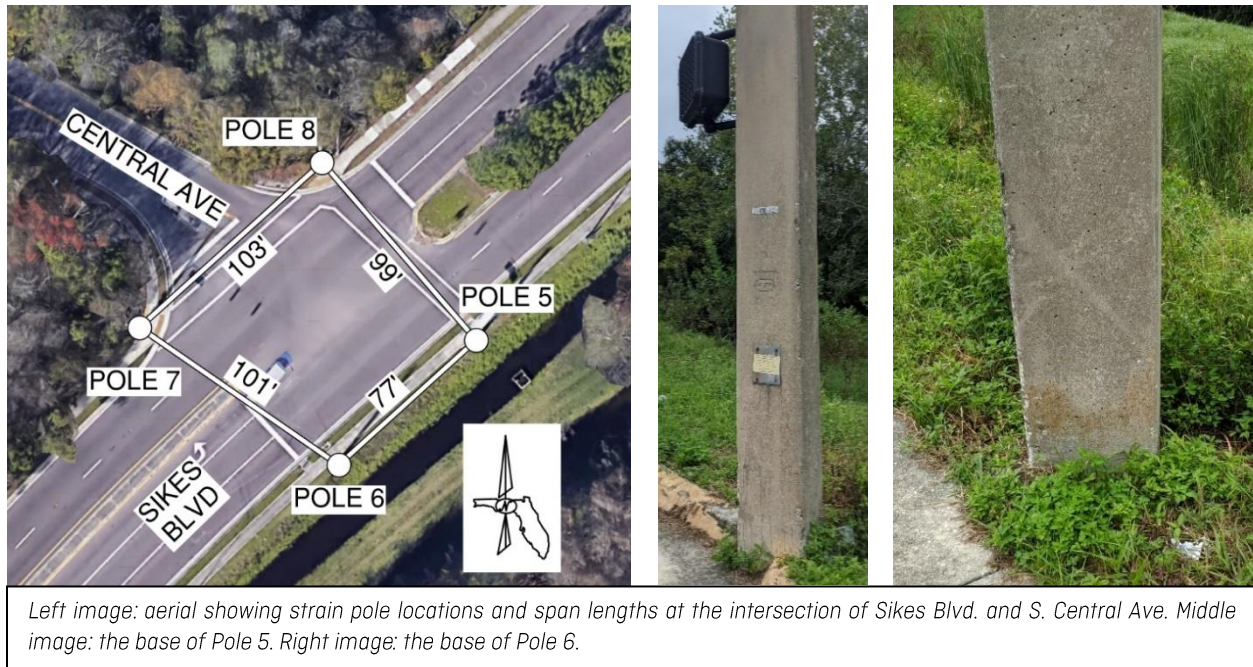


Left image: aerial showing strain pole locations and span lengths at the intersection of Sikes Blvd. and Ariana St. Right image: Pole 1.

Concrete Strain Poles at the Intersection of Sikes Boulevard (SR 563) and South Central Avenue

There is a signalized intersection at Sikes Boulevard and South Central Avenue with concrete strain poles at all four corners, creating a box span. Based on a limited visual inspection, each of the poles appears to be in good condition. Figure 18 depicts the strain pole locations and span lengths at the intersection. Based on desktop analysis, there is approximately 11' - 4" of clear space between Pole 6 and the back of curb, and 10' of clear space between Pole 5 and the back of curb. Only Pole 5 and Pole 6 will be evaluated for potential impacts from the proposed Trail alternatives.

Figure 18: Strain Pole Representation at Sikes Blvd & South Central Ave



Concrete Strain Poles at the Intersection of Sikes Boulevard (SR 563) and Lake Hunter Drive

There is a signalized intersection at Sikes Boulevard and Lake Hunter Drive with concrete strain poles at all four corners creating a box span. Based on a limited visual inspection, each of the poles appear to be in good condition. Figure 20 shows the strain pole locations and span lengths. Based on desktop analysis, there is approximately 9' - 6" of clear space between Pole 10 and the back of curb, and 11' of clear space between Pole 9 and the back of curb. Only Pole 9 and Pole 10 will be evaluated for potential impacts from the proposed Trail alternatives.

Figure 19: Strain Pole Representation at Sikes Blvd & Lake Hunter Drive



Left image: aerial showing strain pole locations and span lengths at the intersection of Sikes Blvd. and Lake Hunter Dr. Middle image: the base of Pole 9. Right image: the base of Pole 10.

Concrete Strain Poles at the Intersection of Sikes Boulevard (SR 563) and West Greenwood Street

There is a signalized intersection at Sikes Boulevard and West Greenwood Street with four concrete strain poles creating a box span. Based on a limited visual inspection, each of the poles appear to be in good condition. Figure 21 illustrates the strain pole locations and span lengths for this intersection. Based on desktop analysis, there is approximately 14' of clear space between Pole 14 and the back of curb, and 3' - 6" of clear space between Pole 13 and the back of curb. Only Pole 13 and Pole 14 will be evaluated for potential impacts from the proposed Trail alternatives.

Figure 20: Strain Pole Representation at Sikes Blvd & West Greenwood St



Left image: aerial showing strain pole locations and span lengths at the intersection of Sikes Blvd. and Greenwood St. Middle image: Pole 14. Right image: a view of Pole 13 (foreground) and Pole 14

Concrete Strain Poles at the Intersection of Sikes Boulevard (SR 563) and Hartsell Avenue

There is a signalized intersection at Sikes Boulevard and Hartsell Avenue with concrete strain poles at four corners creating a box span (see Figure 21). Based on a limited visual inspection, the surface of the concrete strain poles on the east side of Sikes Boulevard adjacent to Lake Hunter are free of cracking and damage. However, the foundations of these concrete strain poles have been exposed by erosion. The aerial image below illustrates the strain pole locations and span lengths at the intersection. Based on desktop analysis, there is approximately 8'-10" of clear space between Pole 18 and the back of curb, and 9'-4" of clear space between Pole 17 and the back of curb. Only Pole 17 and Pole 18 will be evaluated for potential impacts from the proposed Trail alternatives.

Figure 21: Strain Pole Representation at Sikes Blvd & Hartsell Ave



Mast Arms at the Intersection of Sikes Boulevard (SR 563) and West Lime Street

There are four mast arm structures at the intersection of Sikes Boulevard and West Lime Street at the northern terminus of the project corridor (see Figure 22). Each traffic signal structure supports a single mast arm and luminaire. Based on a limited visual inspection, each mast arm appears to be in good condition, showing no signs of corrosion at the base of the upright. The mast arm locations and cantilever lengths can be seen in the aerial below. Based on desktop analysis, there is approximately 10' - 6" of clear space between Mast Arm 1 and the back of curb, and 13' of clear space between Mast Arm 2 and the back of curb. Only Mast Arm 1 and Mast Arm 2 will be evaluated for potential impacts from the proposed Trail alternatives.

Figure 22: Mast Arm Representation at Sikes Blvd & West Lime St



Left image: aerial showing mast arm locations and lengths at the intersection of Sikes Blvd. and Lime St. Middle image: Mast Arm 1. Right image: the upright of Mast Arm 2.

Erosion Along the North Bank of Lake Hunter:

There is evidence of erosion adjacent to the sidewalk bordering Lake Hunter starting approximately 80' west of the intersection at Hartsell Avenue and extending approximately 630' northeast along Sikes Boulevard (see Figure 23). At certain points along the bank, the underside of the sidewalk and concrete pole foundations have been exposed from erosion. The pedestrian signal pole at the southeast side of the Hartsell Avenue intersection is no longer supported on all sides by soil and is listing toward the lake. In the current condition, the stability of the sidewalk and concrete strain poles may be compromised by erosion.

Given the proximity of the lake to the edge of the existing sidewalk and conditions observed in the field, erosion mitigation measures will need to be evaluated as part of the proposed Trail alternatives.

Figure 23: Bank on Lake Hunter Showing Erosion



Left image: view from 100' north of the Hartsell intersection, looking south along the Lake Hunter bank. Middle image: view from 100' north of the Hartsell intersection, looking north along the Lake Hunter bank. Right image: pedestrian signal pole listing toward Lake Hunter.

Roadside Ground Signs

Based on a limited visual inspection, the advance street signs for South Central Avenue, Lake Hunter Drive, West Greenwood Street, Hartsell Avenue, and Lime Street are in good condition. They are multi-column ground signs, each consisting of two vertical posts with two horizontal panel supports. Each of these signs is placed adjacent to the back of the sidewalk with the position of the nearest vertical post about 2' - 4' from the edge of the sidewalk. Based on proximity to the existing sidewalk, each sign will be evaluated to determine if relocation is necessary to accommodate the proposed shared-use path.

In addition to these multi-column ground signs, numerous single column ground signs may need to be relocated to accommodate a shared-use path.

Figure 24: Multi-column Ground Signs



Light Poles

There are many light poles spaced along the east side of Sikes Boulevard within the project limits. Based on a limited visual inspection, all the light poles within the project corridor appear to be in good condition. On the east side of the roadway, there is typically 6" of space between the back of the sidewalk and the edge of the light pole foundations. Based on proximity to the existing sidewalk, all the light poles will be evaluated to determine if relocation is necessary to accommodate the proposed Trail.

Figure 25: Typical Aluminum Street Lighting Along East Side of Corridor



Utilities

The utilities and their owners are listed in Table 10. The utility ticket request associated with this project appears in Appendix C.

Table 11: Utility Ownership

UTILITY OWNER	UTILITY
American Traffic Solution	Electric
AT&T	Fiber
Charter Communications	Fiber
Kinder Morgan/Central Florida Pipeline	Oil Pipeline
Frontier Communications	CATV
Century Link	N/a
DBI Services Inc	Electric, Fiber
City of Lakeland	Fiber
City of Lakeland	Electric
City of Lakeland	Water
City of Lakeland	Wastewater
MCI	Fiber
Duke Energy	Fiber
Teco Peoples Gas	Gas



West Lake Hunter Trail Feasibility Study

